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PREDICTIVE MODELING AND ALUMNI FUNDRAISING IN HIGHER EDUCATION

Mark E. Walcott

132 Pages

May 2015

Institutions of higher education can benefit from using predictive modeling and data mining techniques to enhance capital and fundraising campaigns to yield higher levels of financial contributions. The purpose of this study was to enhance the sophistication of alumni fundraising by using predictive modeling and data mining techniques to address: (a) What factors are most likely to predict the likelihood of alumni making a financial contribution, and (b) What factors are most significant in predicting the amount of money alumni will contribute. Among the 17 variables used by this study those of significance for predicting the likelihood to give included: distance from alma mater, event attendance, volunteer status, degree year, and life stage. Additionally, the linear regression model predicting the amount of a first time gift accurately predicted over 50% of individual giving at the lowest of three donation levels.

PREDICTIVE MODELING AND ALUMNI FUNDRAISING
IN HIGHER EDUCATION

MARK E. WALCOTT

A Dissertation Submitted in Partial
Fulfillment of the Requirements
for the Degree of

DOCTOR OF PHILOSOPHY

Department of Educational Administration and Foundations

ILLINOIS STATE UNIVERSITY

2015

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PREDICTIVE MODELING AND ALUMNI FUNDRAISING
IN HIGHER EDUCATION

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CHAPTER I

THE PROBLEM AND ITS BACKGROUND

Importance of the Topic

Today's global economic crisis has had a severe impact on the financial health of many industries. With dwindling federal and state funding supporting the various sectors of education, it is important that institutions of higher education find alternative ways to fund their strategic and capital campaigns. Marcy (2004) states that most economic and financial models predict that both public and private higher education will face severe financial restrictions for the foreseeable future. This is caused largely by structural deficits at the state and national levels and a stock market and fundraising environment that may not expand for some time, while higher education costs continue to rise at double the rate of inflation (Marcy, 2004). Such a dire economic climate has drastically increased the pressure placed upon those charged with raising funds for academic institutions. A report released in 2013 regarding the financial crisis of higher education nationwide found that states are spending \$2,353 less per students than in previous years and that tuition has increased on average \$2,110 from 2008-2013 (Oloff, Palacios, Johnson, & Leachman, 2013). According to Parry (2009), even as technology continues to change, the established methods of fundraising and young alumni continue to evade their reach. IHE are seeking new strategies beyond the old tactics of direct-mail appeals and student phone banks to raise money. While established tactics of fundraising may

not be garnering the same levels of returns as historically seen, any departure from traditional methods of fundraising may come at significant risk. The risk of even fewer donors, costly implementation costs, and potential job security are all tremendous barriers to exploring new methods of fundraising beyond traditional methods.

Fundraising is a highly competitive and relationship-driven arena that seeks to draw the maximum amount of charitable contribution from a donor. In the best case scenario, personal solicitations are initiated through an individual responsible for raising money for an institution. Those individuals seek to establish relationships with donors and find areas of interests that donors are willing to support financially. Using basic donor information, such as area of expertise, extracurricular activities, and other documented interests, they attempt to nurture this newfound relationship in order to prime donors for future gifts or solicitations. The process of preparing donors for a major gift is completed in various stages commonly referenced by fundraising professionals in the following terms: “research, cultivation, solicitation, stewardship” (Lindahl, 2010). These phases involve determining the financial capacity and interest of the donor, building the relationship, making a formal proposal for a major gift, and recognizing that gift to build future opportunities. While it is beyond the scope of this study to define these phases further, it is important to acknowledge the affect that diminished financial resources for institutions of higher education have had their ability to hire and train fundraising professionals to attract and matriculate donors through the aforementioned stages of preparing donors for a major gift.

Understanding the economic environment provides institutions of higher education with the ability to adjust their strategic goals. Masterson (2009) writes that in

difficult times colleges are forced to alter their agendas, delay capital plan initiatives, and adapt to the changing situations of alumni donors. Reduced operating budgets and giving capacity of donors can reduce the ability for fundraisers to conduct “face-to-face” solicitations and reduce the amount of major gifts directed toward the institution. Consequently, institutions of higher education must adapt their methods to find the most effective means of raising funds, so that institutional resources remain steady or grow to keep an institution financially stable. Thornton (2006) discusses the importance of understanding that fundraising is costly and, if uncontrolled, will begin siphoning resources that could have been spent on charitable output. While reducing the amount of dollars received by each fundraising initiative, a sluggish economy also puts institutions at risk of losing their donors to other causes that donors feel more important. Thornton (2006) argues that many new donors are a result of a situation where fundraising efforts are likely luring donors away from other nonprofits rather than generating new resources for a particular cause. This luring of donors is especially important, because in many campaigns a small number of major gifts construct a large part of the total campaign goal. Andreoni (1998) contends that significant effort must be put into protecting and sustaining donor relations during difficult economic times to help jumpstart campaign drives, which could prevent the siphoning off of an institution’s best donors by other institutions or initiatives. As the economy continues to create a state of uncertainty for fundraisers working in higher education, the use of predictive modeling to identify high potential alumni donors has reemerged in the field of fundraising. Predictive modeling has the potential to increase private funds from alumni, which may increase unrestricted dollars supporting institutional goals subsequently offsetting and decreasing the reliance

upon restricted government and state funds. Leslie (1988) remarks that alumni dollars received from giving generally do not have stipulations on appropriations as other forms of funding such as grants, government, and foundation support. Relying too heavily on grant (non-private) aid also creates a "crowding-out" scenario describing the result of relying less upon private donations, when government grants are available, and not being able to secure those private gifts when grant monies run out or become unavailable (Andreoni & Payne, 2003). The future of many institutions relies upon private gifts, and those private gifts begin with alumni.

Statement of the Problem

In a stagflated economic environment, with scarce resources to support higher education, predictive modeling may help identify alumni who are most likely to make a financial contribution. Lara and Johnson (2008) describe a philanthropic environment for higher education divided evenly between organizational and individual giving. Organizational giving is comprised of various entities, such as foundations, corporations, religious and other organizations, while the remaining gifts are from individuals. Thirty-five percent of individual giving is attributed to alumni contributions (Lara & Johnson, 2008); thus it becomes imperative that institutions of higher education be able to identify high potential alumni donors with greater accuracy and efficiency. Fundraising has a significant role in the economic health of an institution of higher education. Without sufficient financial investment from private sources, such as alumni, friends of the institutions, and corporate gifts, it becomes exceedingly difficult for institutions to operate without sacrificing services and quality. Fundraising has become a primary mechanism in offsetting the reduced funding provided by state and local governments,

while allowing the university to avoid raising costs, such as tuition (Hauptman, 1997) and student fees. As higher education is increasingly seen as a mechanism in upward mobility, it requires institutions to address the “growing gap between resources and expectations” (Hauptman, 1997, p. 29). As state and government funding continue to affect the financial health of higher education, it becomes imperative that institutions find new methods and techniques that help identify potential donors and reliably predict the expected amount of donation from each individual constituent. Worth (1993) states that understanding donor behavior and motivation is “crucial to the practicing fundraiser” (p. 31). While, studies suggest various factors that may contribute to alumni giving such gender, wealth, and various demographic variables. Competing perspectives suggest age, gender, and marital status are poor predictors of alumni giving (Worth, 1993, p. 33), while other theorists suggest that gender, age, and marital status may be significant predictors of alumni giving (Brittingham, 1990; Wiley, 2004). The distinctiveness of individual institutions of higher education ensures that models developed for one institution may not prove significant for another institution, albeit similarities in mission and alumni. Therefore, research must continue in the field of predictive modeling as it relates to fundraising in higher education so the development models and analysis may uncover the nuances among institutions and provide a deeper understanding of how various factors influence alumni giving in varying environments of higher education.

Purpose of the Study

The purpose of this study is to enhance the sophistication of identifying and measuring the likelihood of alumni financially supporting a midsized 4-year public Midwestern university by using predictive modeling and data-mining techniques to help

increase the efficiency and financial success of strategic fundraising campaigns and initiatives.

Research Questions

Predictive modeling or data mining is a process used to create statistical models and explore large data sets that facilitate forecasting future actions, trends, and answer strategic questions (MacDonell & Wylie, 2014). The intent of creating predictive models is to draw insight from applying statistical analysis to data offering the individual or organization new information that can lead to actionable outcomes and data. For the purpose of this study, predictive modeling was used to create two statistical models attempted to answer the following two research questions:

1. What factors are most likely to predict the likelihood of alumni making a financial contribution to their alma mater?
2. What factors are most significant in predicting the amount of money alumni will contribute to their alma mater?

Theoretical Framework

Many theories unpack the motivations and catalysts that result in alumni and other constituency groups financially supporting their alma mater and institutions of higher education. Those responsible for fundraising activities at these institutions continuously seek new methods of identifying, converting, and stewarding individuals towards becoming donors.

Mann (2007) explains that three theories are well suited for fundraising in higher education as they make for clear and understandable connections: altruism, social identification, and relationship-marketing theory (see Figure 1).

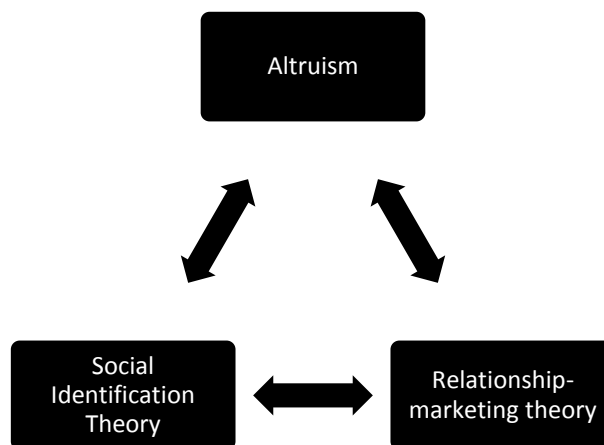


Figure 1. Conceptual Theoretical Framework of Alumni Giving

Altruism is a key factor for fundraisers in higher education as they rely upon it as a mechanism to enhance alumni feelings of connectedness with their alma mater. Specifically, fundraising professionals use this enhanced connectedness to “organize fundraising efforts around such events as reunions, college anniversaries, and campaign goals” (Mann, 2007, p. 38).

Social identification theory suggests that individuals generally construct groups based on their own personal characteristics as well as social or cultural affiliations. Mann (2007) outlines the four principles that construct this theory as: (a) a person’s affiliation with a group can be based solely on the perception that their actions and outcomes are interconnected with the group; (b) a person intimately experiences the “success and failures” of the group; (c) an adoption of the group’s values and norms as personal code of conduct and “guiding principles”; and (d) individuals may perceive familial or

emotional ties with an organization or group that is akin to that of a parental or other form of personal relationships.

Relationship-marketing theory is “that customers vary in their relationships with an organization on a continuum from transactional to highly relational bonds” (Mann, 2007, p. 43). The core goal of this theory is the continual cultivation and reinforcement of positive relationships with donors. Initiatives focused on creating these relationships can become catalysts towards future donations. Practices such as strategic partnering, strategic alliances, friend-raising, and network organizations are all examples of higher education activities that encompass relationship-marketing theory.

These theories were used to form the theoretical lens from which to interpret the results of the analysis conducted in this study. When used in conjunction with each other, these theories allow for a broader understanding of the factors identified by the model and why they may be indicative of donor behavior as they relate to fundraising and the level of gifts that will be donated to their alma mater.

Definitions of Terms

The following unique and technical terms are used in this study.

Alumni: any graduate of an institution of higher education.

Data mining/predictive modeling: a process used to create statistical models that enables individuals to forecast actions or trends (Rouse, 2009).

Donor: any individual who makes a financial contribution to an organization or philanthropic entity.

Predictive variable: a selected factor/variable that may be significant in predicting the state of a dependent variable.

Friend-raising: a process of developing relationships with individuals or organizations with the intent of soliciting future charitable donations from them.

Limitations of the Study

The following limitations were identified for this study:

- The data for this study were drawn from a single institutional database. Since the goal of this study was to develop a model specific to this institution, it is difficult to generalize the results to other institutions.
- Every effort was made to cleanse the data, but it is impossible to ensure that all data extracted from the institutional database is without error, miscoded data, or any other unknown factor that may introduce inaccuracies.

Summary

Predictive modeling and data mining are synonymous terms used to encompass an emergent field that seeks to makes sense of large sets of data. Predictive modeling, when used for fundraising goals, can aid in identifying the right donors for a specific philanthropic opportunity, saving campaign costs and increasing effectiveness (Luan, 2002). Donor activity in higher education may be described as being evenly divided between organizational and individual giving with 35% of individual giving to the institution attributed to alumni contributions (Lara & Johnson, 2008).

The importance of further research and different statistical modeling within this area of study is imperative for institutions of higher education to become more sophisticated in their ability to identify potential donors and their philanthropic interests. Institutions of higher education will need to increase individual giving to counteract the trend of diminishing government financial assistance. Therefore, predictive modeling

may assist in fundraising practices by helping institutions continue to strategically identify and solicit alumni for donations and reduce the cost of operations.

CHAPTER II

REVIEW OF LITERATURE

History of Development in Higher Education

The history of higher education and its philanthropic support in the United States is in part attributed to concepts of charity espoused by Christian beliefs. The Christian beliefs sought to give to the “needy young” from the “assistance that it received from affluent old men” (Rudolph, 1990, p. 178). Between 1790 and 1869, colleges were largely subsidized by low wage-earning faculty and modest tuitions paid by students, with the bulk of funding obtained through the state and private donors (Cohen & Kisker, 2010). There was also local support that existed in the form of produce from local farmers and merchants that believed in the mission of higher education. Despite the desire for non-perishable forms of support, an American university could expect to receive more “produce than pounds,” when garnering local support (Rudolph, 1990, p. 182). Of course, securing such gifts as “produce and pounds” was generally in the hands of clergymen who were the principles individuals conducting fundraising activities (Rudolph, 1990) focused on individuals and organizations. These clergy represented the first iteration of professional fundraisers within the scope of the American higher education landscape. Even at this nascent stage of development of the American system of higher education, alumni were still a significant part of the economic and developmental maturity. In 1821, alumni of Williams College formed the first alumni

association, and within 40 years had raised sufficient funds to construct the first “Alumni hall” (Lindhal, 2010). Efforts such as those conducted by the alumni of Williams College ushered in an era that continues today where alumni financially support their alma maters. As the operating environment of higher education became more complex, the United States of America experienced many changes that increased the necessity of fundraising. Miller (1993) describes one such instance as the 1862 Morrill Act that helped establish nearly 149 new schools and inadvertently increased operating costs for states and required that institutions instill a duty in their alumni to support their alma mater. Government assistance providing capital to higher education is only one of six principle sources of charitable contribution. Leslie and Ramey (1988) describe alumni, non alumni, foundations, business corporations, religious organizations, and miscellaneous sources as others sources of charitable donations funding higher education. While understanding that the source of funding for higher education is important, it was vital for universities and college administrators to secure funds in the forms of major gifts for use by the institution. While present-day solicitations can be executed by phone, mail, or electronic means, during the 1600s, Oliver (1999) recounts that historical methods of solicitation ranged from boat trips to Europe, beggars on horseback, church-initiated campaigns, letter-writing campaigns and personal solicitation of more substantial gifts from personal fortunes created during the 19th century. Historically, fundraisers for institutions stayed within a 40- to 60-mile radius of the institution (Oliver, 1999). It could be reasoned that this radius had some correlation with the available mechanisms for travel and message delivery, but such analysis is beyond the scope of this study.

Post Antebellum America

Although historically many solicitations came from various iterations of “face-to-face” communication, such acts are used for only the most substantial contributors today. Cohen and Kisker (2010) share that solicitations were historically conducted by an institution’s president or board of trustees, but as prominence grew for various institutions so did their sophistication in fund raising methods. The enhanced sophistication consisted of seeking funds from various sources, such as business owners, industrialists, and developing networks of alumni (Cohen & Kisker, 2010). This sophistication generally took the form of a campaign. A capital campaign or “campaign”, as more commonly known, is “an organized, intensive, fundraising effort to secure extraordinary gifts and pledges for a specific purpose or program during a specified period of time” (Worth, 2010, p. 7). Cook and Lasher (1996) affirm that as higher education matured in the early 20th century, the campaign became an integral element of an institution’s fundraising strategy, but the core fundraising activities were conducted by the president and necessary assistants (Cook & Lasher, 1996). By reaching donors through various forms of networking and communication, schools found that the amount and number of their donations increased.

Mr. Charles Summer Ward is considered by some to be the “father of modern fundraising” (Sargeant & Shang, 2010, p. 30), as he oversaw many fundraising campaigns, most notably for the YMCA, that contained a silent phase, a period where no public announcements are made, that allowed for the public phase of the fundraising period to last only a week. However, it was the tenets of Ward’s approach that have endured into modern day practice: concentration of time, organization, sacrifice, and

education (Sargeant & Shang, 2010). According to Sargeant and Shang (2010), these various phases meant to reduce the amount of time required that people would need to invest into the campaign, increase the preparatory work in order to execute the campaign, mobilize the necessary resources, instill the belief that every effort of the public volunteers was necessary for success, educate all of the importance of the cause, and ensure that all those works were effectively communicated to potential donors and supporters.

During the early 1900s, nearly 30 years after the 1862 Morrill Land Grant Act, states began to fund institutions of higher education through taxation, as they were seen as points of pride by those within and outside their respective states (Thelin, 2003). Progressing to the mid-1930 through 1975, many changes occurred that allowed institutions to receive funds from a more diverse set of sources, the most affluent of those new areas being corporations. In 1935, the federal tax code was amended to allow corporations to deduct up to 5% of their pre-tax net income for charitable gifts (Cohen & Kisker, 2010, p. 280). While the change in tax code provided an additional source of gifts for universities and colleges, it was not as widely utilized by business as was been expected. Additionally, a 1953 court case, *A.P. Smith Manufacturing Company v. Barlow et al.*, upheld the legality of corporate gifts and the court found that corporate gifts strengthen society, which in turn benefits business (Hillman, 2002; Brittingham & Pezzullo, 1990). Since then, corporate giving has become an integral part of the external funding for higher education. While these various changes in law and campaign practices helped philanthropic foundation of higher education, it was a single conference that led to the fundraising advanced organization and political structure that provided a framework

from which to build the future for fundraising in higher education.

Advancement Services

The Greenbrier Conference of 1958 was a point of transition in higher education as it was the catalyst to the construction of advancement services. The Greenbrier Report recommended that the functions of public relations, fund raising, and alumni relations be integrated under the umbrella of institutional advancement, with a coordinating officer, usually a vice president with status equal to chief administrators, in charge of business affairs, student affairs, and academic affairs (Cook & Lasher, 1996). As these functions became more prevalent in higher education, universities began to execute campaigns and other fundraising efforts in house without the use of consultants. Hillman et al. (2002) found that in the 1960s and 1970s the use of university-employed directors of development as opposed to outside consultants became more frequent. The increase in fundraising positions at universities helped spur collegiality and increased professional development within the fundraising arena, which facilitated the 1974 American College Public Relations Association (ACPRA) and American Alumni Council (AAC) merger that formed the Council for the Advancement and Support of Education (CASE), combining all professionals in advancement/development activities (Hillman, 2002). The creation of advancement services, coupled with the prior union of the major fundraising consulting firms in 1935 to form *The American Association of Fundraising Counsel* (AAFRC), laid the framework for present day fundraising practices to flourish.

Diversification

The privatization of university research has provided an additional source of revenue for institutions of higher education. This stream of revenue is a result of

legislation and litigation giving institutions the opportunity to obtain patents and participate in the free market. This facilitation into the free market was made possible through the 1980 “University Small Business Patent Procedures Act,” more commonly known as the “Bayh-Dole” act. This legislation permitted all universities to begin patenting and licensing federally-sponsored research on a large scale (Washburn, 2004). The “Bayh-Dole” act also created an environmental counter culture to the open-access and peer review processes that institutions of higher education used as means of vetting and ensuring the quality and accuracy of published research. Further analysis of the affect the “Bayh-Dole” act had upon institutions of higher education is beyond the scope of this study, but it is important to note that while the “Bayh-Dole” act provided new means of funding institutions of higher education, it concurrently altered the landscape of higher education by making data and research that would have existed as public domain subject to patent law and increased costs of accessing and developing such research (Mowery et al., 2001).

Despite the diversification in fundraising sources for higher education, alumni remain the predominant source of philanthropic dollars. An analysis conducted in 2005-2006 asserted that private support for institutions of higher education was received in the following proportions: 30% from alumni, 20% from other individuals, 16% from corporations, 25% from foundations, 1% from religious organizations, and 7% from other sources (Cohen & Kisker, 2010). Fifty percent of fundraising is accomplished through the solicitation and stewardship of individual donors; thus, the future and success of institutions lay with alumni, donors, and friends. As such, is it important to continue learning how to keep individuals engaged and committed to the mission and support of

institutions of higher education.

The future of fundraising will require that professionals be able to identify the unique interests and affinity that a potential donor shares with the organization. Broad mass mailing and phone-a-thons that fail to acknowledge the unique interests of a donor have begun to see a decline in their effectiveness in raising money for an institution. This decline is a result of donors becoming more active in defending themselves from traditional mass fundraising strategies and becoming increasingly reliant upon new sources of information to form opinions beyond television, newspapers, and advertising (Miller, 2009). Therefore, fundraisers must concurrently learn how to better target donors with appropriate messaging and fundraising opportunities, while developing new means of informing and communicating with donors beyond mass direct mail and large volume calling/phon-a-thons. The history of fundraising in higher education is complex and has been influenced by political, economic and social factors. The art and science of fundraising must continue to evolve as these influential factors continue to change the landscape of higher education and fundraising efforts. Institutions of higher education maintain a plethora of data that pertain to an individual's experience, interaction, and engagement with the institution and data that highlight an individual's experience apart from the institution. The volume and complexity of the data that we use to define alumni cannot be understood without a model or framework from which to interpret and organize the information. Bolman and Deal (2008) express that frameworks "make it possible to register and assemble key bits of perceptual data into a coherent pattern" (p. 11).

Theories of Fundraising

For researchers to make meaning of the data held by institutions of higher education, a framework is required to guide selection and interpretation of data and understand the limitations from which conclusions and inferences can be drawn. The motivations and theories that compel a donor to give are equally as important to understand as the theories and deterrents that dissuade alumni from financially supporting their alma mater. The theories of fundraising are best applied when they address both the positive and negative factors of alumni financial support. The works of Mann (2007) and Wastyn (2008) were used to review the theories of fundraising within higher education.

Mann (2007) focuses on the use of theoretical frameworks to help guide strategic decision making processes to better direct fundraising efforts. Understanding the complexity of fundraising within higher education, Mann sought to extend the understanding of alumni giving beyond theories of altruism. While theory of altruism provides a “perspective for why some individuals make donations, it does not account for other contributing bodies of literature that provide a more comprehensive understanding of philanthropic motives” (Mann, 2007, p. 36). Mann explores multiple theoretical frames as they relate to motivations regarding alumni giving, but only five will be examined in this paper. The selected frameworks include charitable giving, organization identification, social identification, service-philanthropic, and relationship-marketing to build the theoretical constructs used for analysis.

Three main motivations explain why people give in the charitable giving framework: altruism, reciprocity, and direct benefits (Mann, 2007). Mann explains that these three factors are well suited for fundraising in higher education as they make for

clear and understandable connections. Altruism is a key factor well known by fundraisers in higher education, as they rely upon it as a mechanism that enhances alumni feelings of connectedness with their alma mater. Specifically, fundraising professionals use this enhanced connectedness to “organize fundraising efforts around such events as reunions, college anniversaries, and campaign goals” (Mann, 2007, p. 38). Reciprocity, as it relates to alumni giving behavior, “is the belief that the motivation for an alum to make a gift is based on the potential return of some benefit, while also adhering to the three requirements of an obligation to pay, receive, and repay” (Mann, 2007, p. 38). The limitation of reciprocity is that it becomes challenging to create opportunities that are capable of accommodating the multitude of needs and expectations of an alumni base. The last of the three factors, direct benefits, generally refers to some tangible reward or benefit alumni may receive as a result of their contribution to their alma mater. While the frame of charitable giving provides a perspective as to why alumni may give, it is also important to understand how alumni relationships with their alma mater may influence their philanthropic behaviors.

The organizational identification framework suggests that an individual’s perception of their relationship with an organization is a key component in increasing the likelihood or desire to give. According to Mann (2007), this framework relies on the desire to share and participate in the positive construction and evolution of the organization. Mann (2007) references five reasons as to why individuals donate: self generated convictions as to the institution’s merits, objectives and plans of the institution, efficiency of the institution, competence of the institution’s leadership, and tax. Additionally, the limitations of this particular frame is that it is too intertwined with other

competing constructs and factors of organizational identification that undermine the strength of this frame and create “confusion” (Mann, 2007). The strengths of this framework provide a mechanism to uniquely identify key concepts that may be found in survey results and other direct communication from alumni that provide a means of understanding their strength of identification and thus begin to predict their likelihood of making a future gift. Still, it is important to remember that in the age of a “networked society” that is capable of forming its own social groups and norms (Miller, 2009), social identification and influence become an integral part of one’s identity and motivation to give.

Social identification theory suggests that individuals generally construct groups based on their own personal characteristics as well as social or cultural affiliations. Mann (2007) shares the four principles that construct this theory as:

1. A person’s affiliation with a group can be based solely on the perception that their actions and outcomes are interconnected with the group.
2. A person intimately experiences the “success and failures” of the group.
3. An adoption of the group’s values and norms is a personal code of conduct and “guiding principles”.
4. An individual may perceive familial or emotional ties with an organization or group that is akin to that of a parental or other form of personal relationship.

Social identification as a frame for alumni giving can be insightful in providing fundraisers an additional lens to construct donor profiles and execute philanthropic campaigns.

Mann (2007) describes the services-philanthropic framework as being influenced by the following constructs: service value, service quality, and satisfaction. These three values dictate that donors will assess the benefit of making a gift as it relates to what they may have given up in order to make the gift; how the donor feels the organization utilizes the funds for general operations and services that benefit them; and the satisfaction with the general quality and experience associated with the organization. The value of this theory is that it provides a multi-layered analysis of donor intent, expectation, and perception as they relate to both the financial donation and the organization.

The basic premise of relationship-marketing theory is “that customers vary in their relationships with an organization on a continuum from transactional to highly relational bonds” (Mann, 2007, p. 43). The core goal of this theory is the continual cultivation and reinforcement of positive relationship with donors. Initiatives focused on creating these relationships can become catalysts towards future donations. Practices such as strategic partnering, strategic alliances, friend-raising, and network organizations are all examples of higher education activities that encompass relationship-marketing theory.

Why Alumni Don’t Give

Wastyn (2008) and other researchers state that the weakened economic environment in which universities must operate have led to an increased reliance on alumni support. Instead of focusing on methods of uncovering potential donors, Wastyn seeks further understanding on the reasons donor choose not to give. By failing to analyze the motives and demographics of non-donors, prior research has failed to provide insights as to why, each year, nearly 90% of alumni nationwide decide not to make a gift

to their alma mater (Wastyn, 2008). It becomes imperative to understand non-donor motives as to someday convert them into donors. The conceptual framework for Wastyn's analysis came from "supply-side" theories for giving, which suggest that donors have an inherent desire to make a difference in the world, and donor needs come before those of the institution (Wastyn, 2008).

Using a qualitative research design, data were drawn from interviews with 12 randomly selected non-donors of a medium sized Midwestern university. Wastyn (2008) found that donors' reasons for not giving clustered around six themes. First, the consumer model of higher education, which posits that universities sell knowledge and students purchase it, and once a student graduates, the transaction is complete. As such, there is no duty to give after that transaction is complete. Secondly, colleges are not needy as they have other means of revenue, students are not needy, universities have enough money, and tuition is too expensive. Third, misperceptions of giving in that donors do not believe their donations would make a difference. Forth, an uncertainty of how the college uses donations was a major concern. Donors felt that their money would be lumped into a larger budget and not utilized effectively. Fifth, transactional issues were an issue, as donors were not always the spouse who made such decision, discomfort with how they were solicited, and not able to give in a method they found convenient. Sixth, giving with the heart and not the head was a theme that reflected the notion that donors do not always have rational reasons for their philanthropic actions.

The number of theories that provide a lens from which to examine alumni giving and motivation demonstrate the complexity and variance of alumni philanthropic behavior. Therefore, it becomes problematic to utilize a single theory to explain alumni

philanthropic behavior, since using a single theory may fail to identify or dismiss key components of a donor's behavior. To overcome such theoretical oversight, researchers should use multiple theories to help discern the philanthropic behaviors of donors that focus on different elements of donor motivation and environmental factors that all contribute to the likelihood of a donor making a gift to their alma mater.

Theoretical frameworks are essential tools in making meaning of the data, results, and behaviors that explain the factors and motivations associated with alumni giving. Researchers must make meaning of the data held by institutions of higher education in order to effectively use construct strategic plans and goals that will advance the missions and agendas of institutions of higher education. It is important to note that no single framework can explain every donor and their motivations for giving, and it is always prudent to consider multiple frameworks to construct a more comprehensive profile of their alumni and their motivations for giving.

Leadership and Predictive Modeling

Many theories of leadership exist within higher education. According to Siegrist (1999), educational leadership theories have evolved dramatically throughout the century, yet all these theories and advances have managed to generate far more questions than answers.

Siegrist (1999) explained that:

Historically, leadership has been seen to be based on power. Early leadership studies addressed leadership traits and the focus was on differentiating between leaders and non leaders. Later, contingency and situational models looked at differences between effective and less effective leaders. Others have suggested that leadership behaviors are driven by individual "mindscapes" or worldviews or by mediation abilities. From the wealth of literature in the field, one might conclude that leadership is structurally and behaviorally based, or one might

subscribe to the emerging view that cultural or transformational leadership' must be the central focus of school administrators, or that truly effective leaders are visionaries. Others suggest that the practice of followership provides the basis for leadership and that leaders play a vital stewardship or servant role. (p. 299)

The environmental landscape of leadership in higher education must be able to address a multitude of competing interests as they relate to the academic, political, and social pressures from internal and external sources. As discussed by Kezar et al. (2006), different types of leadership paradigms exist that influence current theories of leadership: positivist, social constructivism, and postmodern. These different types of leadership paradigms, while assessing and constructing the notion of leadership differently, all justify the use of predictive modeling methods as a means of making decisions within their respective constructs of leadership.

Predictive Modeling/Data Mining

The intent of creating predictive models is to draw insight from applying statistical analysis to data, offering the individual or organization new information that can lead to actionable outcomes and data. According to Delmater and Hancock (2001), data mining is often used for four purposes: to discover relationships, make predictions, facilitate decision making, and improve processes while following six basic steps.

- Problem definition
- Data evaluation and collection
- Data coding and categorization
- Testing and model development
- Model evaluation
- Implementation

The four purposes of data mining, as outlined by Delmater and Hancock (2001), can also be reframed into two categories—prediction and description—as identified by Usama Fayyad et al. (1996). In reframing relationship discovery and predictions into the predictive category and decision making and process improvement into the description category, it becomes possible to apply specific data mining methodologies to accomplish the goals of prediction and description. Usama Fayyad et al. (2006) describe the following techniques as core data mining methods:

- Classification is a prediction technique that seeks to classify data into discrete categories.
- Regression is a prediction technique that converts various data into a single predictor variable.
- Clustering is a descriptive tool that attempts to identify various categories or clusters describing the data.
- Summarization is a descriptive technique that uses descriptive statistics such as means, standard deviations and other measures to provide succinct summaries of the data.
- Dependency modeling is a descriptive tool that provides strength of dependency between variables in a data set.
- Change and deviation detection focus on “discovering the most significant changes in the data from previously measured or normative values”. (p. 45)

Predictive modeling enables institutions of higher education to more effectively target individuals capable of making a gift by using institutional data to construct probabilities of alumni most likely to make a gift (Lindahl & Winship, 1992), and the total dollar amount of a potential gift. However, any tool such as those offered by predictive modeling must be supported and understood by leadership; thus, it becomes important to understand how predictive modeling tools and methodologies can be interpreted by various leadership paradigms.

Positivist Paradigm of Leadership

The positivist paradigm of leadership believes that a single truth can be known and, most importantly, can be explained through absolute truths. Positivist assumptions lay the foundation for trait, behavioral, power and influence, and contingency theories of leadership (Kezar, Carducci, & Contreras-McGavin, 2006). At the core of the positivist paradigm is the classical scientific model of discovery and understanding (Otto, 2009). The classical scientific model consists of the formulation of a question, hypothesis, prediction, testing, and analysis. This linear method of discovery and analysis speaks to the positivist paradigm of leadership that assumes “that a phenomenon can be separated from its context and isolated for study” (Kezar, Carducci, & Contreras-McGavin, 2006). The data mining and statistical elements of predictive modeling follow closely with the positivist practice of using the scientific model as constructing statistical models requires following the familiar steps of developing a question, constructing a model, and testing and verifying the model against various populations. Therefore, the leaders that practice positivist methods of leadership would find the tools and techniques associated with predictive modeling to be a natural fit in conducting analysis associated with the core leadership and fundraising tasks.

Social Constructivist Paradigm of Leadership

Social constructivism asserts that knowledge is a product of one’s culture and the meaning and definition of that knowledge is transmitted by society (Otto, 2009). The importance of social constructivism in leadership theory is that it focuses on an individual’s social and cultural identity as a means of defining leadership practices and tendencies. If leadership represents a symbol of authority or power, then it can become

subject to social construction as it adapts and changes based on cultural and personal values (Bolman & Deal, 2008). By virtue of knowledge and meaning being derived from personal and cultural context, there exists no single truth, nor definition of leadership. Instead, individuals chose their perspective of leadership or truth amongst many that seem most real. As noted by Dr. Otto (2009), social constructivism asserts a difference in the social realm of human interaction from the natural world and should be treated and studied differently. Therefore, tools such as predictive modeling that allow for the identification, clustering, and classification of data based on the unique values attributed to each donor and the selection of such values based on the uniquely constructed view of philanthropy of an institutions, provide the flexibility and scientific rigor to construct results pursuant to the culture and needs of an individual institution.

Postmodernism Paradigm of Leadership

Good leaders in higher education understand the complexities of the environment and do their best within their locus of control to advance and ameliorate the campus for both professional and academic pursuits. Poor leaders are those who fail to understand the uniqueness of higher education and seek to instill a “regime” that may not suit the nature of the institution. Any leader who believes a “one method fits all” style of leadership is destined to fail. As defined by Kezar et al. (2006), the postmodern paradigm of leadership is:

...a rejection of modernist views of the world—including a belief in an objective, continuous, linear view of reality with an autonomous individual who controls his or her destiny. Emphasizing subjective and local experiences, history and context, fluidity and change. (p. 23)

While social constructivist and postmodern paradigms value the impact of the environmental context of which the leader operates, Kezar et al. (2006) points out that postmodern leaders desire to link local contexts and factors to larger trends within the communal and global environment. Postmodernism paradigms of leadership encompass new theories and perspectives of leadership, such as chaos theory, which asserts that organizations required new ways of organizing and managing themselves in a world of “constant flux and unpredictability” (Wheatly, 1994). Predictive modeling provides postmodernist leaders with tools that can provide the opportunity to draw meaning from large volumes of data that would otherwise seem chaotic if sifted through sequentially by an individual. The ability for predictive modeling to create predictive and inferential lenses capable of summarizing and organizing data to be used to make strategic decisions, while preserving local and environmental factors through variable selection and construction, is a natural fit for this leadership paradigm.

Strategic Planning

With many institutions facing a near perfect storm of crisis as they deal with decreased federal funding, high unemployment, and increased competition for existing donor loyalty (Klein, 2004), it has become increasingly important to engage in strategic planning efforts to help bolster alumni giving and increase philanthropic dollars to the institution. The most common form of philanthropic strategic planning and execution, as it pertains to alumni fundraising, is the capital campaign. A capital campaign or “campaign”, as it is more commonly referred to, is “an organized, intensive, fundraising effort to secure extraordinary gifts and pledges for a specific purpose or program during a specified period of time” (Worth, 2010, p. 7). Common metrics cited during campaigns

are the 80/20 and “rule of thirds”. The 80/20 rules, states that about 80% of the fundraising campaign goal will come from the top 20% of donors, while the rule of thirds states that a third of the gifts will come from the top 10 gifts, a third from the next 100 gifts, and the final third from all the remaining smaller gifts (Worth, 2010).

According to Flumerfelt and Banachowski (2011), leaders should engage in six areas to become successful leaders in higher education. Those areas are: (a) allocating scarce resources, (b) analyzing root causes of problems, (c) attending to group dynamics, (d) clarifying roles and responsibilities, (e) confronting ambiguity, and (f) maximizing communication. Predictive modeling can facilitate addressing these six characteristics of leadership in higher education by providing an empirical method from which to base decisions in addressing these areas of concern. The various methodologies and tools of predictive modeling can aid leadership of various theoretical perspectives (positivist, social constructivist, etc) in addressing the six challenges of leadership, while identifying alumni who are likely to give and the probable gift amount that all contribute to the advancement of the institution’s mission and goals.

The Anatomy of a Donor

As funding for institutions of higher education dwindles due to government cutbacks and increasing costs, the institutions have sought additional means of bolstering their revenue stream. The most frequently utilized method is the solicitation of alumni and private sector donations. Though raising funds through alumni giving is common practice, it has not been highly developed and has only recently gained renewed focus as institutions seek to more effectively generate larger donations with lower investment costs. To target potential donors, fundraisers have used demographic variables and data

associated with the undergraduate and alumni experience as factors to help construct the anatomy of a donor. The anatomy of a donor being the unique set of variables that best reflects the construct of financially supportive alumni.

The following list represents a subset of variables that Sun et al. (2007), Weerts and Ronca (2007), Galligan (2013), and Mesch et al. (2002) found as significant factors (n=14) in predicting the likelihood and amount of an alumni gift: (a) **income**, (b) **age**, (c) **gender**, (d) **race/ethnicity**, (e) **fraternity/sorority membership**, (f) **employment status**, (g) **alumni activity**, (h) **distance from the alma mater**, (i) **years after graduation**, (j) **marital status**, (k) **curriculum/major past**, (l) **family ties to the alma mater**, (m) **number of postgraduate campus visits**, and (n) **contacts with faculty members**.

Demographic Variables

Weerts and Ronca (2007) found that **age** was a powerful indicator in predicting the likelihood to provide financial or volunteer support to their alma mater. For each unit increase in age, an alumnus is 1.09 times more likely to volunteer at the institution and alumni that fell into the supporter category (alumni who give and volunteer) had an identical increase in probability based on age (Weerts & Ronca, 2007, p. 25). Sun et al. (2007) found similar trends when reporting that age was a factor in the amount of money donated by an alum and, as alumni grew older, so did their contributions; but after age 52 the frequency and amount of donations began to decline. Being **employed** nearly doubled the likelihood of an individual supporting their alma mater. Various studies have found a relationship between household income and employment with the capacity of a gift, and this study provided no contrary evidence to previous studies (Sun et al., 2007).

The connection between volunteer support and employment suggests access to stronger networks of influential people or organizations of interest to colleges and universities. Sun et al. (2007) explained that individuals who held a philosophy of philanthropy believed that alumni should support their alma mater through financial and volunteer efforts. Additionally these alumni believed that their alma mater needed their financial and volunteer efforts and were appropriately nine times more likely to give than other constituency groups. These findings suggest that alumni who are likely to give and volunteer at their alma mater expect to be involved in supporting the institution (Weerts & Ronca, 2007, p. 30).

Using data believed to be commonly available to institutions of higher education, Lara and Johnson (2008) found that **income, marital status, age, gender, active alum, fraternity/sorority member, and degree level attainment** were all significant factors in predicting the likelihood of an alum making a financial gift to their alma mater. Sun et al. (2007) also found that gender was a significant factor in the likelihood of an individual donating to their alma mater with women having a greater probability of giving than men. Differences in gender can be observed when analyzing the frequency and amount of a gift. Lara and Johnson (2008) found that men give less often than women do, but men give an average of over \$200 more per person when they give. Family income was also found to be an important factor in determining alumni giving, as families with higher income were more likely to become donors (Martin, 1993). High-income individuals are more likely to give and are more generous in the gifts given, while single alumni are less likely to give and give an average of \$622.25 less than married alums when they do give (Lara & Johnson, 2008, p. 16). Widows and widowers are more likely to give than their

peers, but tend to give on average \$350 less (Lara & Johnson, 2008).

The College Experience

The study conducted by Sun et al. (2007) found that variables associated with student experience are strong indicators of alumni donations. Hoyt (2004) and Conner (2005) share similar findings when they note that those who have financially donated to their alma mater generally rated their instructional experience more favorably. This observation suggests that variables constructed from sources such as student data could be used to measure quality of instruction, providing another source of predictive variables. Student data that measure the amount of faculty contact outside the classroom could prove to be a powerful indicator of future donor status, as faculty contact is a positive influencer of student satisfaction. As supported by Conner (2005), faculty-contact outside the classroom is a “critical component” of the undergraduate student experience. Additionally, alumni donors are much more likely to have had cumulative grade point averages in the “A” range and had received a scholarship of \$1,000 or more (Hoyt, 2004, p. 14). Many researchers have identified the correlation between financial aid and alumni-giving. Martin (1993) discovered that donors were three times more likely to have received financial aid, grants, or other forms of scholarships. It is important to note that the type of aid received is important in regards to the likelihood of becoming a future donor. Those individuals who received loans as a part of their financial aid package were less likely to donate than those who received no loans (Dietz, 1985). The importance of curriculum and college major are also key factors because, “16 percent of the high alumni donor group graduated from the business school” (Sun et al., 2007, p. 312). Individuals who participated in social clubs or activities were more likely

to give than those students who did not participate in any student life associated activities. Experiences that led to greater student satisfaction are prime factors for having a possibility of predicting future giving (Conner, 2005). Students who actively participated in activities related to leadership development or institutional traditions or ceremonies were also more inclined to become donors as these activities increase student satisfaction. Specifically, Connor (2005) shared that students who attend formal ceremonies are more likely to be vested and connected to the institution than those who do not participate and are therefore more likely to become donors in the future.

The importance of the college experiences is imperative in creating alumni that donate to their alma mater. Student experience can be defined as students who were “satisfied with their academic experiences, and who believe their college education contributed to their career success” (Sun, Hoffman, & Grady, 2007, p. 308). However, a vital step in that transition was that students who donated the year after their graduation were likely to donate again in the future (Sun et al., 2007), thus enhancing the strength of other alumni factors associated with financially contributing to their alma mater.

Alumni Factors of Giving

Sun et al. (2007) sought to investigate the relationship between student experience, alumni experience, alumni motivation, and demographic variables and their association with alumni giving. Alumni experience was defined as experiences and interactions with an institution after graduation. Alumni motivation was defined simply as the desire for alumni to give back to their alma mater. Variables associated with alumni experiences are strong predictors of alumni giving. Sun et al. (2007) found that:

Alumni experience significantly distinguishes alumni donors from non-donors. Since alumni experiences are closely related to alumni marketing efforts such as parties, reunions, newsletters, and solicitations, the results confirm that these efforts do engage alumni, and that alumni may be more likely to donate than those less or not engaged. (p. 327)

Sun et al. (2007) also noted that the motivation to give by alumni was intrinsically linked with how well they are informed of the activities and associated news of the institutions stating that “alumni who were more informed about the university had more positive perceptions of it, were more aware of and linked with perceived institutional needs, and, therefore, were more likely to give than those not well informed” (p. 327). The informed alum that becomes a donor is more likely to perceive that the college needs donations and has a worthy cause, and they are less likely to prefer giving to other charitable or religious causes versus to the college (Hoyt, 2004). The strength of faculty connections with alumni is equally as important as those connections created during the undergraduate experience. Conner (2005) found that “maintaining contact with faculty/staff or administrators after one has graduated” was a significant predictor in determining the likelihood of becoming a donor. These connections also extend beyond faculty, as those individuals belonging to alumni groups and chapters were also more likely to be donors than those individuals who did not belong to groups. Group membership reinforces organizational values and integrated individuals into the institutional culture that serves as deeper connection between alumni and their alma mater (Conner, 2005). The perceived satisfaction of alumni is also an important component of alumni giving, but satisfaction is a highly abstract construct that uniquely varies between donors and institutions. However, some variables prove to be common amongst institutions regarding alumni satisfaction and those are degree of emotional attachment, perceived

career success, and nostalgia. Conner (2005) and Beeler (1982) found that the perception of how well alumni felt they were prepared for their first job was a significant factor between donor and non-donor status. Emotional attachment is a nebulous factor that can be viewed as an institutionally constructed variable based on available data. Conner (2005) explains that emotional attachment can be explained in a variety of manners using personal and organizational variables, and emotional attachment can be derived from variables that provide the following insight of an alum's feelings: proud to tell people about the institution, willing to volunteer, feel like they are members of the institutional community, and would recommend the university to a potential student. Factors such as emotional attachment and alumni motivation are just a few of the variables that may differ amongst institutions and between the types of institutions.

Differences Amongst Institutions

No significant differences exist between private and public 4-year institutions as they relate to factors predicting donor status. However, community colleges compared to both private and public 4-year institutions have a relatively short history and tradition of philanthropy (Babitz, 2003; Ryan, 2003; Skari 2011); thus do not have the same alumni data available for analysis. Having long relied upon state and municipal funding for their financing, community colleges have found those sources incapable of fully supporting operations and have sought private support to offset those funding shortages from state and municipal sources. Skari (2011) explains that "two year colleges are becoming increasingly state-assisted, not state-supported," while also noting that fundraising and alumni relations within the community college setting is still new and requires significant work to reach the same alumni participation and giving rates as their private and public 4-

year counterparts. Skari (2011), Babitz (2003), and Ryan (2003) all remark on the naissance of fundraising within community college and the attempts by those responsible for fundraising within the community college to develop and document best practices as they relate to these activities. Factors consistently cited for 4-year institutions as being predictive of donor status are not always as predictive for community college alumni populations. Skari (2011) found that wealth and prestige were not significant variables due to the open access and admission policies of most community colleges. While, there is little research on factors that contribute to the likelihood of becoming a donor to a community college, studies have shown that there are similarities between demographic variables that predict alumni donors for 4-year institutions and community colleges. Demographic variables such as gender, marital status, and proximity to the institution are all common factors (Skari, 2011) and suggest that models developed for 4-year institutions may be able to serve as templates for community colleges as they continue to develop their own unique fundraising practices and standards.

As funding for institutions of higher education dwindles due to government cutbacks and increasing costs, the institutions will increase their reliance upon private giving, and specifically alumni, in order to reach various fundraising goals. As institutions seek to become more effective in financing and executing their fundraising efforts, predictive modeling and data mining will serve as the means of creating meaningful plans of action, using demographic variables and data associated with the undergraduate and alumni experience. The future of fundraising for institutions of higher education will depend on how efficiently and effectively they identify factors that best predict the likelihood of their alumni to become first time and continued financial

supporters of the institution.

Gap Analysis

The use of predictive modeling in higher education is still predominately executed using specialty software or large firms that produce numbers and models without explaining the intricacies or theories pertaining to statistical analysis and methods used to reach these “alumni scores.” Additionally, there is a lack of scholarly articles that outline the process of predictive modeling for fundraising and advancement professionals to use as a means to build their own models or conduct comparative analysis to measure success, affinity, or other forms of benchmarking figures. Studies that do address predictive modeling such as those conducted by Thompson (2010) focus on multi-institutional analysis or studies conducted by Sun et al. (2007), Jin (2006), and Sun (2005) that examine institutions of various types such as private, two year, and others that are different from the 4 year public mid-west institution explored by this study. This study serves to provide additional modeling techniques which institutions can use as a means of beginning their own study and advancing techniques that reflect the population of a mid-size 4-year public institution.

CHAPTER III

RESEARCH DESIGN

Purpose of Research

The purpose of this study was to enhance the sophistication of alumni fundraising for a mid-sized, 4-year public Midwestern university by utilizing predictive modeling and data mining techniques to identify statistically significant variables predicting alumni donors and how much money they are likely to donate for their first gift.

Research Questions

Predictive modeling or data mining is a process used to create statistical models and explore large data sets that facilitate forecasting future actions, trends, and answer strategic questions (MacDonell & Wylie, 2014). The intent of creating predictive models is to draw insight from applying statistical analysis to data that provides the individual or organization with new information that may lead to actionable outcomes or additional insight. For the purpose of this study, predictive modeling was used to create two models that answered the following research questions:

1. What factors are most likely to predict the likelihood of alumni making a financial contribution to their alma mater?
2. What factors are most significant in predicting the amount of money alumni will contribute to their alma mater?

Research Design

For this study, a secondary data analysis design was selected using alumni data from a traditional 4-year public institution of higher education in the Midwest.

According to Mertler and Vannatta (2005), in non-experimental design the researcher can define the independent variables but cannot assign individuals to the various groups, as subjects enter the study already belonging to various groups as categorized by the selected variables/groups. The alumni database of the mid-sized 4-year public Midwestern university was utilized to investigate the relationships with data associated with demographics, professional and educational attainment, wealth, and institutional connectedness upon the likelihood of alumni financially contributing to their alma mater and a predicted range of money that would be donated.

Procedure

Defining the Target Population

The target population for this study was alumni from a mid-sized 4-year public Midwestern university. For the purposes of this study, alumni were defined using the definition set forth by the Council for Aid to Education for use in their Voluntary Support of Education Survey (VSE), “Alumni [are] former students—full- or part-time, undergraduate or graduate—who have earned some credit toward one of the degrees, certificates, or diplomas offered by the reporting institution” (Brakeley, 1972). The VSE definition for alumni was chosen to facilitate future comparative analysis amongst differing institutions. The population was stratified by the racial/ethnic designation in order to facilitate stratified random sampling. Stratified random sampling, “is commonly done when researchers want to compare groups that are not equally represented in the

population” (Vogt, 2007, p. 79). A stratified sample helped create a sample population that is consistent with the population of alumni at the 4-year public Midwest university.

Number of Cases

According to the Alumni Association of the 4-year public Midwest University, there are more than 180,000 alumni, but only those alumni that fit the alumni criteria defined by the VSE were selected. Using SPSS (Statistical Package for Social Sciences), and information provided by the institution regarding the racial/ethnic status of their alumni, a stratified random sample totaling 20,000 cases was drawn that fit the VSE criteria for the study, and the stratas were be based on racial/ethnic designation. This sample size was calculated based on recommendations according to Wylie (2004) who suggests that, with a population of half a million records, a minimum sample size of 10,000 records would be necessary for analysis.

Missing Values

The data collected came from the alumni database of a 4-year public Midwest University. Any cases that were missing values were discarded and another case randomly selected.

Research Methods

Predictive modeling or data mining is a process used to create statistical models and explore large data sets that facilitate forecasting future actions, trends, and answer strategic questions (MacDonell & Wylie, 2014). The intent of creating predictive models is to draw insight from applying statistical analysis to data offering the individual or organization new information that can lead to actionable outcomes and data. The processes and techniques associated with predictive modeling and data mining are akin to

the methodology and established practices of quantitative research techniques, as quantitative research “is a means for testing objective theories by examining the relationship among variables” (Creswell, 2009). For the purpose of this study, inferential and descriptive statistics were used to conduct analyses consistent with the use of predictive modeling and data mining techniques. The results of these analyses and techniques were two models that sought to answer the two research questions:

1. What factors are most likely to predict the likelihood of alumni making a financial contribution to their alma mater?
2. What factors are most significant in predicting the amount of money alumni will contribute to their alma mater?

Logistic Regression

Logistic regression is a statistical method in multivariate analysis used when the dependent variable is categorical. Binary logistic regression overcomes issues of homoscedasticity, linearity, and normality as a result of the difference in distributions when dealing with continuous and dichotomous dependent variables (*cf.* Menard, 2001). Additionally, when using logistic regression, the goal is predicting the likelihood of the dependent variable being 1 or 0, depending on the independent variable.

Multivariate analysis is a powerful tool that is best suited to answer the basic question, “how much better can I predict (or explain) a dependent variable (Y) if I know an independent variable (X)?” (Vogt, 2007, p. 146) when using regression analysis and “what is the expected change in L (the log of the odds or logit) for one-unit change in X?” (Vogt, 2007, p. 206).

Conducting the Logistic Regression

In order to determine the independent variables' predictive influence of the donor/non-donor status of an individual, a binary logistic regression model was conducted using SPSS v. 20.0. To identify the best factors for the model, this study employed "the best subset" variable selection method. This method "identifies a specified number of best models containing one, two, three variables and so on, up to a single model containing all the explanatory variables" (SAS/STATA, pp. 1904, 1999).

Evaluating the Logistical Regression Model

When evaluating the effectiveness of a logistical model, Chao-Ying et al. (2002) states that one must attend to: (a) overall model evaluation, (b) statistical tests of individual predictors, (c) goodness-of-fit statistics, and (d) validations of predicted probabilities (p. 5). The most effective means of evaluating a model is to compare the results with actual data. To determine the model's effectiveness, it was used to score the sample population in order to predict donor status. The score was assigned by creating 20 percentile groups based on the calculated probability. These groups facilitated interpretation and business application by creating ordinal groups that provide rank and a simpler reporting figure instead of the calculated probability, with the highest percentile groups containing the majority of the donor population and the lower percentile groups containing a majority of non-donor population.

Multiple Linear Regression

Multiple linear regression analysis is a technique associated with multivariate analysis that attempts to create an equation to predict the value of a dependent variable based on the values of multiple independent variables. Vogt (2007) provides an analogy

that encapsulates the essence of multiple linear regression. He states, “the independent variables of a multiple regression can be thought of as storytellers, [while] the story is the dependent variable” (Vogt, 2007, p. 168). Independent or predictor variables in regression analysis seek to accomplish two major goals—explain the variance within the dependent variable and provide a statistically significant regression coefficient. To accomplish these two goals, I interpreted the “regression coefficient” that provides a numerical representation of the effect upon the dependent variable with a single unit increase in the independent variable. It is important to note that the size of the regression coefficient is dependent upon the unit of analysis used by the dependent variable. Vogt (2007) explains that “the difference in size of regression coefficients has to do with the size of the variable and how they are measured” (p. 147). Thus, it becomes imperative that researchers intimately understand the nature of the dependent variables and the correct measure of analysis. The variance represented by the statistic “*r*-squared” is “an estimate of the total variance in the dependent variable predicted by or explained by or associate with all the independent variables taken together (Vogt, 2007, p. 147). The *r*-squared statistic provides researchers with the ability to measure the amount of the dependent variable that is explained or influenced by the associated independent variables.

Computing a Multiple Linear Regression Model

The independent variables used for the linear regression model to predict the amount of money of an alum’s first gift were initially drawn from the variables used in the logistical regression model. Additional variables were included if shown to increase the predictive strength of the model. Each independent variable was individually

analyzed to gauge various measure of central tendency and to determine if the variable was normally distributed. The next step involved investigating the individual relationship of each independent variable with the dependent variable (amount of first gift). The strength of these relationships was determined by examining the correlation coefficient and graphs, such as scatter and box plots, that helped determine if the variables were linearly related. Upon completion of this initial analysis, further investigation continued with determining the relationship of all the independent variables simultaneously upon the dependent variable to obtain a matrix correlation coefficient. The goal of conducting these preliminary tests and calculations were to reduce computational and methodological errors in analysis, such as multi-collinearity and non-linear relationship between the independent and dependent variables. Once these various test and measures were calculated, then a regression equation was created and various statistical procedures conducted to ensure the validity and strength of the model.

Evaluating the Multiple Linear Regression Model

To evaluate the model, the strength of the predictor variables as they related to the dependent variable were tested. In addition, an analysis of the r-squared value was conducted to determine the best model. The most effective means of evaluating a model is to compare results with actual data. In an effort to determine the effectiveness of the model, the model was used to analyze past donor first time gifts by predicting the actual first time donor group of the sample population.

Independent Variables

The variables selected for use in this study were selected by analyzing prior research (Sun et al., 2007; Weerts & Ronca, 2007; Galligan, 2013) that found

demographic, college experience, and variables associated with the alumni experience were possible predictors of individuals who would likely donate to their alma mater.

Previous research regarding alumni donor behavior cited various demographic data such as age, gender, and ethnicity as being contributing factors to the likelihood of an alum making a financial contribution to their alma mater (Thompson, 2010). Table 1 contains a list of variables and their scale of measurement that were used as demographic variables in conducting the logistical and linear regression models for the two research questions.

Table 1

Independent Variables Associated with Demographic Information

Name	Scale	Description
Title	Nominal	PhD, Professional, or Military designation
Age	Ratio	Age of alum
Marital Status	Nominal	Whether an alum is listed as married or single
Number of kids	Interval	The number of children associated with alum
Gender	Nominal	Is the alum male or female
Ethnicity	Nominal	What ethnicity is the alum
Address	Nominal	The types of address held by the constituent
Zip code	Nominal	The presence of a zip code for a primary address
Distance from alma mater	Interval	The distance in miles for alma mater

Prior research regarding alumni donor behavior has cited various data associated with the undergraduate college experience, such as Greek sorority and fraternity affiliation and being an athlete, as contributing factors to the likelihood of an alum making a financial contribution to their alma mater (Thompson, 2010). Table 2 contains a list of variables and their scale of measurement that were used as connectedness variables in conducting the logistical and linear regression models for the two research questions.

Table 2

Independent Variables Associated with Connectedness

Name	Scale	
Extracurricular activities	Nominal	Did they participate in extra curricular activities (Greek/Athlete/Band/Multiple)
Live in residence hall	Nominal	
Distance from alma mater	Interval	
Participated in a student organization	Nominal	
Email	Nominal	

Prior research regarding alumni donor behavior has cited various data associated with the alumni experience, such as giving history and attending alumni events, as contributing factors to the likelihood of an alum making a financial contribution to their alma mater (Thompson, 2010). Table 3 contains a list of variables and their scale of measurement that were used as alumni experience variables in conducting the logistical and linear regression models for the two research questions.

Table 3

Independent Variables Associated with Alumni Experience

Name	Scale
Attended alumni events	Nominal
College	Interval COE, COB, etc.
Volunteer	Nominal
Degree Year	Nominal

Dependent Variables

This study answered the following research questions:

1. What factors are most likely to predict the likelihood of alumni making a financial contribution to their alma mater?
2. What factors are most significant in predicting the amount of money alumni will contribute to their alma mater?

The first research question used a dichotomous variable titled “Donor status” to identify the donor status of the alum, where “1” represented alumni who had previously donated and “0” alumni who had never made a gift. The unit of analysis was the binary state of being a donor or non-donor. The second research question produced a nominal variable titled “First time giving,” that reflected the predicted gift range that would be donated to the institution by the alum. The unit of analysis was a monetary value measured in U.S currency.

Results

The results of this study included a logistical regression model that calculated the probability of a non-donor being converted into a donor and a linear regression model

that provided a projected dollar range of an alumnus first gift. The two models created by this study have specific data elements, such as *r*-squared, beta-values, and variables, that may be used as points of comparison with other studies of similar intent and focus.

CHAPTER IV

ANALYSIS OF RESULTS

The purpose of this study was to enhance the sophistication of measuring the likelihood and donation level of alumni financially supporting a 4-year public Midwest university. This was achieved by using predictive modeling and data mining techniques to help increase the efficiency and financial success of strategic fundraising campaigns and initiatives. The results of this study are discussed in the following broad sections as they relate to the research questions.

Research Questions

Predictive modeling or data mining is a process used to create statistical models and explore large data sets that facilitate forecasting future actions, trends, and answer strategic questions (MacDonell & Wylie, 2014). The intent of creating predictive models is to draw insight from applying statistical analysis to data offering the individual or organization new information that can lead to actionable outcomes and data. This chapter seeks to answer the following research questions:

1. What factors are most likely to predict the likelihood of alumni making a financial contribution to their alma mater?
2. What factors are most significant in predicting the amount of money alumni will contribute to their alma mater?

Data Analysis

The data were analyzed using IBM SPSS Statistics 20 and Microsoft Excel. The various methods of statistical analysis included descriptive statistics, logistical regression, multi-linear regression, and correlational analysis.

Overview of Cumulative Giving and Donor Status

The data provided by the participating institution contained 20,000 records for analysis. The cumulative giving variable was a calculation of the total amount of money donated by a specific constituent to the institution. This figure only counted gifts received and did not include deferred or non-cash contributions. The significance of this variable is that it was used to determine the donor status for individual constituent records. In reviewing this variable it was observed that 71% of individuals had never donated to the institution. With such a large percentage of alumni who had never made a gift, the variable was organized into three groups. The three groups were individuals who had “never given”, given between \$1-\$99, and given \$100 or more. The two giving groups consisting of those who had donated \$1-\$99 and gifts over \$100 was calculated by dividing the remaining 28.3% of donors into two nearly equal groups where logical break points were evident. The purpose of creating two groups within the donor category was to mimic the organizational practice of segmenting donors using annual and major level distinctions. For the purpose of this analysis, annual level donors were individuals who had donated between \$1-\$99 and major level donors were those who had donated \$100 or more. These categorizations were not identical with those of the institution of study, because the data provided by the institution for analysis did not contain sufficient records to accurately reflect their total population of annual and major level donors, which for the

institution included corporations and other non-human legal entities that were beyond the scope of this study. For the purposes of this study, if a variable was found to have a relationship with either donor group of \$1-\$99 or \$100 or more, it was considered as significant to the donor status. The data depicted in Table 4 show the number of constituents that comprised each group as calculated by the cumulative giving variable.

Table 4

Donors Group by Giving Group

	Frequency	Percent	Valid Percent	Cumulative Percent
Never Given	14330	71.7	71.7	71.7
\$1-\$99	2842	14.2	14.2	85.9
\$100 or more	2828	14.1	14.1	100.0
Total	20000	100.0	100.0	

Research Question One: Variable Analysis

What factors are most likely to predict the likelihood of becoming an alumni donor was investigated using descriptive statistics, custom tables showing the counts of donors that fell into each donor giving group by factor, and using one way analysis of variance (anova) to test the strength of the relationship between the reported factor and whether the cumulative giving was greater than \$.01, which was coded into a binary variable called “Giver” (0,1). Only the variables that were found to have a significant relationship with donor status were analyzed in depth. Selected variables where no significant relationship was found with donor status are presented here with discussion of the possible factors influencing the insignificance of the relationship.

Several variables were found to have a significant relationship with the binary variable of donor status called “Giver” (0-never given, 1-donated). These variables and their relationship and their strength in the calculated logistical regression model are discussed in detail.

Table 5

Independent Variables Associated with Demographic Information

Name	Scale	Description
Professional designation	Nominal	Medical doctor or Ph.D.
Age	Ratio	Age of alum
Marital Status	Nominal	Whether alum is listed as married or single
Number of kids	Interval	The number of children associated with alum
Gender	Nominal	Is the alum male or female
Ethnicity	Nominal	Ethnicity is the alum
Surrounding states	Nominal	Does the alum lives adjacent to the state
Distance from alma mater	Interval	The distance in miles for alma mater
Extracurricular activities	Nominal	Did they participate in extra curricular activities (Greek/Athlete/Band/Multiple)
Live in residence hall	Nominal	
Extracurricular Activities	Nominal	Participated in a student organization
Attended alumni events	Nominal	
College	Interval	COE, COB, etc.
Business Phone	Nominal	
Degree Year	Nominal	
Volunteer	Nominal	

Business Phone

The data contained in Table 6 provide evidence of a relationship with the presence of a business phone and giving group. Of the individuals within the sample population without a business phone, 24.3% had made a donation to the institution. Of the population with a business phone associated with their record, 45.6% of those had made a gift.

Table 6

Giving Group Segmented by Presence of Business Phone

		Recoded (Final) Giving Group					
		Never Given		\$1-\$99		\$100 or more	
		Count	Row N %	Count	Row N %	Count	Row N %
Business Phone	Absent	12265	75.7%	2114	13.0%	1827	11.3%
	Present	2065	54.4%	728	19.2%	1001	26.4%

(F(1,19998)=707.79, p = .000)

The one-way analysis of variance conducted to further investigate the significance of the relationship between donor status and the presence of a business phone confirmed the strength of relationship reported in the Table 6. The results of the ANOVA shown in Table 6 (F(1,19998)=707.79, p = .000) confirm a statistically significant relationship between business phone number and donor status. The strength of this relationship could be a result of the high probability that the presence of a business phone implies employment. The relationship between employment and donor status has been repeatedly found in prior research (Okunade, 1997; Xiaogeng et al., 2007; Skari, 2011) and is consistent with the results derived from this study. The ability to donate and the

contribution amount can be easily influenced by the earning power of the alum. Weerts and Ronca (2007) stated that “employment status is a critical variable distinguishing alumni who were most likely to [give]” (p. 29). It is likely if this study were to have had a discrete variable for “employment status,” then the business phone variable would not have been a significant finding. However, in the absence of a discrete variable such as employment status, variables associated with employment status are likely to be a significant factor in predicting alumni donor status.

Number of Children

The data shown in Table 7 provide evidence of a relationship between the number of children linked to a constituent record and their status as a donor. Of the sample population with no children, the percentage of non-donors is similar to that of the grand population at 71.7%. This is a much higher percentage in comparison to individuals with children, where only 45% have never made a gift.

Table 7

Giving Group Segmented by Number of Children

Number of Children	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
0	13071	76.0%	2247	13.1%	1888	11.0%
1-3	1162	45.0%	549	21.3%	870	33.7%
4+	97	45.5%	46	21.6%	70	32.9%

(F(2,19997)=598.96, p = .000)

The one-way analysis of variance conducted to further investigate the significance of the relationship between donor status and the number of children associated with a constituent confirmed the presence of a significant relationship between the variables as reported in the Table 7.

A Tukey Post-Hoc test was conducted to identify the significance between groups and the results of this analysis. The results are provided in Table 8. The post-hoc test identified that the means of the two groups representing individuals with children were significantly different than the group with no children associated with the constituent record. The “1-3 children” group (M=.55, 95% CI[.53,.57]) and the constituent group with “4+ children” (M=.54, 95% CI[.48,.61]) have means that are significantly different from those constituents that had no children “0 children” (M=.24, 95% CI[.23,.25]) in their household.

Table 8

Tukey Post-hoc Multiple Comparisons of Giving Group Segmented by Number of Children

(I) RC Number of Kids	(J) RC Number of Kids	Mean Difference (I-J)	Sig.
0 Kids	1-3 Kids	-.309*	.000
	4+ Kids	-.304*	.000

*The mean difference is significant at the 0.05 level.

This study found, in the sample population with no children, the percentage of non-donors at 76% was much higher than the grand population of 71%. In comparison to the 45% of individuals with children who had never made a gift. With approximately 55% of individuals with children being donors to the institution, it became clear that a relationship existed between the two variables: donor status and the number of children.

This relationship may be influenced by the practice of many institutions of higher education conducting targeted fundraising campaigns focusing on parents of current students. If such campaigns were conducted at this institution, it would explain the strong relationship between donor status and the number of children. As parents are targeted for financial contributions and records are created to reflect their donor status and corresponding parent and child relationship in the system, this would provide the basis for the strength of relationship between the two variables. If the age of the children were available for analysis, it might be found that parents of college age children are the most likely to become donors as opposed to parents in general. Additional research investigating these two variables should be conducted, since other institutions may have such granular data about parents and the various demographic characteristics of their children. The strategic focus on the relationship between parent and student would be an effective application of relationship-marketing theory, as it focuses on the possible parental relationship and converts that relationship into an effective marketing and fundraising strategy. This strategic emphasis on the parental relationship enforces the core goal of relationship-marketing theory being the continual cultivation and reinforcement of positive relationship with donors such that the relationship from parent to student to institution is acknowledged and leveraged to increase the likelihood of a donation from either the parent or student.

Participation Volunteer

The number of constituents coded as volunteers represented only 2% of the total sample population used for this study. Table 9 shows that of the constituents who were identified as volunteers, approximately 65% were donors who had given at least \$1. Of

the variables identified in this study, being a volunteer yielded the largest percentage of donors.

Table 9

Giving Group Segmented by Volunteer Participation

		Recoded (Final) Giving Group					
		Never Given		\$1-\$99		\$100 or more	
		Count	Row N %	Count	Row N %	Count	Row N %
Participation Volunteer	No	14,185	72.4%	2745	14.0%	2652	13.5%
	Yes	145	34.7%	97	23.2%	176	42.1%

(F(1,19998)=291.276, p = .000)

A one-way analysis of variance was conducted to further investigate the strength of the relationship between donor and volunteer status. The results of the ANOVA shown in Table 9 (F(1,19998)=291.276, p = .000) confirm a statistically significant relationship between volunteer and donor status. Since there were fewer than three groups, no post-hoc analysis was necessary. The significance of being identified as a volunteer, as evidenced by Weerts and Ronca (2007), and the level of engagement represented by this group, warranted an investigation as to the strength of this relationship with donor status. Social identification theory suggests that volunteers are likely to adopt and share the values and norms of the institution making them feel intimately connected to the institution. This connection was described by Weerts and Ronca (2007) as alumni feeling “that the institution needs their support” and this need, if leveraged through relationship-marketing theory, creates an effective mechanism of creating the message, means, and motivation for alums of this institution to support their alma mater. One of the

limitations of this variable was that there was no means of determining whether the volunteer period was during undergraduate or alumni years. Avalos et al. (1999) found that “participating in volunteer service during college is associated with attending graduate school, earning higher degrees, and donating money to one's alma mater” (p. 196). While it is plausible that the conclusion reached by Avalos et al. may apply to the alumni of the institution examined by this study, determining the extent to which undergraduate volunteerism influenced alumni giving for this Midwestern public university would be best explored by future research at this institution. For this Midwest institution, volunteering is an important aspect of identifying potential donors among its alumni base.

Distance from Campus

The distance in miles that constituents reside from the main campus may influence the number of communications (mail, email, etc), event invitations, and face-to-face contact with university officials. This variable was analyzed because of the potential that distance may have on the strength of relationship with the institution influencing the possibility of a constituent being a donor. To analyze the possible relationship between distance (in miles) and donor status, four groups were created. Three of the groups created were constructed to have approximately 33% of the constituents with known addresses, while the fourth represented individuals with no known address. Table 10 shows that the percentage of donors who had never given and had no address was much greater than all other groups with known addresses. However, that group also has the least number of individuals as compared to groups with known addresses.

Table 10

Giving Group Segmented by Distance from Campus

Distance from Campus	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
Unknown	1689	92.6%	94	5.2%	41	2.2%
1-87 miles	4121	68.2%	892	14.8%	1026	17.0%
88-124 miles	4403	73.3%	891	14.8%	714	11.9%
125+ miles	4117	67.2%	965	15.7%	1047	17.1%
(F(3,19996)=169.871, p = .000)						

A one-way analysis of variance was conducted to confirm the strength of the relationship between donor status and distance from campus, and the results confirmed the presence of relationship, as reported in the Table 10. The post-hoc test reported in Table 11 confirms that there was no significant difference in the number of donors in the groups where constituents were 1-87 miles from campus and more than 125 miles. There remains a significant difference between the other two groups, those with no available address and constituents who were 88-124 miles away from campus.

Of the three groups representing constituents with known addresses, those individuals who reside between 1-87 miles from campus and more than 125 miles were less likely to be non-donors. Although, constituents between 88-124 miles had a percentage of non-donors greater than the sample population of 71.1%, that could be explained by the lack of communication and engagement with those individuals in comparison to the other groups. The findings of this study support prior research that

indicates that proximity to campus has a positive relationship with donor status. The tenets of social identification theory provide an explanation of the relationship between distance from campus and donor status. The positive relationship between proximity to campus and donor status can, in part, be related to the high exposure to institutional messaging, events, and opportunity to engage with agents of the institution, which increase the identification and relationship of the alum to the institution.

Table 11

Tukey Post-Hoc Giving Group Segmented by Distance from Campus

(I) RC Distance From ISU		Mean Difference (I-J)	Sig.
Missing Data	1-87 miles	-.175 [*]	0.000
	88-124 miles	-.134 [*]	0.000
	125+ miles	-.198 [*]	0.000
1-87 miles	Missing Data	.175 [*]	0.000
	88-124 miles	.042 [*]	.000
	125+ miles	-.023 [*]	.035
88-124 miles	Missing Data	.134 [*]	0.000
	1-87 miles	-.042 [*]	.000
	125+ miles	-.065 [*]	0.000
125+ miles	Missing Data	.198 [*]	0.000
	1-87 miles	.023 [*]	.035
	88-124 miles	.065 [*]	0.000

*The mean difference is significant at the 0.05 level.

Professional Designation

Advanced degrees or professional designations can be an indicator of an individual's area of employment or academic achievement, which are both factors that

prior literature (Sun et al., 2007) suggest will have a relationship with the likelihood of a donor to contribute to their alma mater. Due to the coding mechanisms used by institution, individuals who had earned a M.D or PhD were used to investigate the relationship between professional designation and donor status. For brevity, the term “doctors” will be used in lieu of professional designation for this section. In Table 12, the relationship between donor status and doctors is demonstrated by 49% of doctors who were donors, and 32% of doctors who had given at the highest donor group of ”\$100 or more.”

Table 12

Giving Group Segmented by Professional Designation

	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
Others	14,145	72.0%	2780	14.2%	2,711	13.8%
Doctors	185	50.8%	62	17.0%	117	32.1%

(F(1,19998)= 79.468, p = .000)

A one-way analysis of variance was conducted to further investigate the strength of the relationship between donor status and professional designation, and the results confirmed the presence of a relationship reported in the Table 12. Since there were fewer than three groups, no post-hoc analysis was necessary. Advanced degree or professional designation can be an indicator of an individual’s area of employment. Academic achievement and potential wealth are both factors that previous studies (Bruggink & Siddiqui, 1995; Lindahl & Winship, 1992; Belfield & Beney, 2000) suggest have a

relationship with the likelihood of a donor to contribute to their alma mater. The employment data provided by the institution was insufficient to use as an effective variable for this study. Therefore, the educational attainment (PhD) and professional designation (M.D) of alumni were used as a means of assessing the strength of relationship between employment, academic achievement, and potential wealth and donor status. It was assumed that those individuals who had attained those levels of academic achievement were likely to have a greater earning potential. It was found that 49% of individuals whom have earned a M.D or PhD were donors, and 32% of that group had given at the highest donor group of "\$100 or more." These findings were consistent with prior research that had drawn similar conclusions, stating that area of employment, academic achievement, and potential wealth are each strong predictors of alumni donor status or their likelihood to become future donors. To better understand the complexity of these constructs of employment, academic achievement, and potential wealth and their relationship with donor status, it would be necessary to individually measure these variables using discrete data points and evaluating their relationship with predicting and identifying donor status. It could be speculated that separating this variable of professional designation into individual factors of employment status and academic achievement could provide greater precision and predictive power for the resulting statistical model.

College Affiliation

The academic discipline in which an individual attains their degree was identified by Sun et al (2007), Weerts and Ronca (2007), Galligan (2013), and Mesch et al. (2002) as having a relationship with the donor status of an individual. Based on Table 13, there

is evidence that certain degrees may have a positive influence on donor status and that others may have a negative influence. Specifically, the colleges of business and nursing have a larger percentage of donors than the grand population at 31.6% and 47.7%, respectively.

Table 13

Giving Group Segmented by College Affiliation

Degree College	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
Natural Sciences	4863	73.0%	885	13.3%	916	13.7%
Technology	3196	72.9%	589	13.4%	599	13.7%
Fine Arts	777	71.0%	170	15.5%	148	13.5%
Business	2469	68.4%	526	14.6%	615	17.0%
Education	2687	72.0%	571	15.3%	476	12.7%
Nursing	169	52.3%	88	27.2%	66	20.4%
(F(8,19991)= 14.740, p = .000)						

A one-way analysis of variance was conducted to further investigate the strength of the relationship between donor status and college affiliation, and the results confirmed the presence of relationship, as reported in Table 13. A Tukey post-hoc analysis confirmed that the colleges of business and nursing both had means that were significantly different from the other groups. Based on these findings, two additional variables representing college affiliations with business and nursing were used in the logistical regression and replaced the original variable that included all colleges. It is

important to note that while other colleges did not yield any significant relationship with donor status, it should not be concluded that their alumni are not as equally committed or engaged to the institution. While there was no surprise in business graduates being donors due to the popularity of the college and number of majors that generally yield high paying salaries such as accounting, international business, and finance majors, it was the nursing school that was unexpected because of the relative low number of alumni as compared to other colleges. Despite this low number of alumni, it is clear that this group is capable of making significant financial contributions. According to the website “All Nursing Schools” (2004), “Nursing is not only an in-demand profession, nursing salaries are also fairly lucrative. With the current nursing shortage, qualified nurses can find exceptional nursing career opportunities across the country.” Social identification theory explains the strength of college affiliation as it relates to these colleges fostering a great deal of shared values that focus exclusively on a single discipline, unlike the other colleges that have widely disparate majors. The additional practice of many colleges to engage in practices that promote alumni activities, communications, and affinity groups may add to the strength of affiliation that these alumni have with their alma mater. A variety of factors, such as salary earning power, represents their ability to financially support their alma mater; culture of philanthropy, as it relates to the college teaching their alumni while they are students the importance of financially supporting their alma mater; overall, the relationship that colleges have been able to sustain with their alumni are all factors that may influence the importance of college affiliation. Additionally, the college affiliation variable may be sensitive to changes in institutional culture, which may involve other colleges improving their ability to educate and encourage their students to

become alumni that support their alma mater through charitable donations. It should also be understood that the emotional attachment suggested by social identification theory, and how that manifests in the relationship of alumni with their alma mater can form a strong theoretical foundation for the significance of college affiliation in the model developed for predicting donor status. For this Midwestern university, college affiliation was a key factor in determining the likelihood of an alum being a financial donor to the institution. Additionally, this institution should continue to investigate the possible influence of alumni that minored in any major within these specific colleges, as this study did not account for areas of study designated as minors, which could possibly be a significant factor.

Graduation Year

Previous studies (Sun et al., 2007; Weerts & Ronca, 2007; Galligan, 2013; Mesch et al., 2002) have found that the number of years since graduation may have an effect on the likelihood of being a donor. To test that assumption, degree year was segmented into three groups, based on a percentile analysis, where each group contained approximately 33% of the total population. This segmentation allowed for a deeper analysis of the graduation year variable and accounted for the possibility that older alumni are more likely to be donors. The data presented in Table 14 shows a strong relationship between graduation year and donor status. As the years since graduation decrease, the number of donors decrease. This relationship suggests that as number of years since graduation increases their likelihood to become a donor also increases. This relationship is derived from Table 14, where the number of donors in both donor groups increases as the number of years since graduation increases. It is important to note that this graduation year

represents the year of their first degree. Any other degree year that a constituent may have associated with their record as a result of attaining multiple degrees is not included in this analysis. Additionally, the number of non-donors in groups that earned degrees prior to 2000 is lower than the number of non-donors of the grand population at 71.7%.

Table 14

Giving Group Segmented by Degree Year

Degree Year Group	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
1952-1985	3,600	54.7%	1,304	19.8%	1,672	25.4%
1986-1999	4,522	69.9%	1,012	15.6%	937	14.5%
2000-2013	6,208	89.3%	526	7.6%	219	3.1%
(F(2,19997)=1110.783, p = .000)						

A one-way analysis of variance was conducted to further investigate the strength of the relationship between donor status and degree year, and the results confirmed the presence of relationship reported in the Table 14. In analyzing the Tukey Post-hoc test to determine which groups had significant difference in means, it was found that every combination of group held significant difference. The result was that each group representing degree year (1952-1985, 1986-1999, 2000-2013) held a statistically significant difference when inferring to donor status. Additionally, the number of non-donors in groups that earned degrees prior to 2000 were both lower than the number of non-donors of the grand population at 71.7%. The conducted logistical regression equation constructed for this research question yielded a positive beta value of 3.08 for

graduation year, which confirms the positive relationship between the two variables found in this study.

Constituent Age

Previous studies conducted by Key (2001) and Sargeant (1999) found that older alumni are more likely to donate than younger alumni. To investigate the relationship between donor status and age, it was necessary to reduce the variability of age from over 100 different individual groups to a series of age ranges. Therefore, age was reduced into three groups, which were representative of the following age ranges: 22-37, 38-51, and over 52 years of age. The groups were created by using a cumulative frequency table based on age to create three near equal groups of constituents. The data reported in Table 15 suggest that, as alumni get older, the likelihood of giving increases as demonstrated by the declining number of individuals who have never given as age increases. The pattern of fewer individuals who are not giving as constituents become older indicates a relationship between donor status and constituent's age. The percentage decrease of 34% between the youngest age group and the oldest group of individuals who have never given is a notable difference and provides additional evidence to the strength of relationship between donor status and age. The inverse relationship also exists when looking at constituents who have donated, where the number of donors who have given increases as age increases in both categories of donor groups \$1-\$199 and \$100 or more.

Table 15

Giving Group Segmented by Constituent Age

	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
22-37 Years/Old	5,836	89.4%	511	7.8%	184	2.8%
38-51 Years/Old	4,614	71.5%	971	15.0%	872	13.5%
52+ Years/Old	3,880	55.3%	1,360	19.4%	1,772	25.3%
(F(2,19997)= 1139.695, p = .000)						

A one-way analysis of variance was conducted to confirm the strength of the relationship between donor status and age and the results confirmed the presence of relationship reported in Table 15. Since there were more than two groups, a Tukey's post-hoc analysis was conducted. The results of the post-hoc revealed that each group was significantly different from each other, which is consistent with the data presented in Table 15. The relationship between donor status and age is a positive one, where as age increase so is the likelihood of being a donor and becoming a member of most prestigious donor group of those who have made gifts of "100+ or more" dollars. Key (2001) and Sargeant (1999) assert that "as donors become older they are more likely to give" (p. 224). That can be attributed to a greater amount of disposable income or deeper relationships with organizations that serve their philanthropic interests. The data gathered for this study show that as individuals increase in age, the likelihood of giving a gift increases and the likelihood these donors will be making contributions at the highest giving levels. The pattern of diminishing individuals who are not giving as constituents

become older is also an indication of a relationship between donor status and a constituent's age. The percentage decrease of 34% between the youngest age group and the oldest group of individuals who have not given is a notable difference that provides additional evidence to strength of relationship between donor status and age. Future research should examine the relationship between "life stage" and donor status. As suggested by Sargeant (1999), "life stage" would be a variable that would encompass present needs based on experiences as a means of determining their likelihood to become donors. The difficulty of constructing such a variable for analysis would ultimately be defining a set of distinct life stage categories and determining measurable variables that could be used to create each stage. The social identification theory may also play a role. Aging donors may seek to adopt the group's values and norms as a personal code of conduct and "guiding principles" as these individual seek methods by which to continue and instill their legacy for future generations. Prior literature has found that older alumni are more likely to donate than younger alumni. In lieu of being able to calculate or construct a variable defining a "stage of life," the age of a donor is still a worthwhile variable in calculating the probability of a donation from an alum as it provides a broad mechanism to capture data similar to "stage of life".

Marital Status

The data provided by the institution identifying marital status originally held nine distinct categories. For the purposes of this study, those nine groups were reduced into two groups: not married and married. The reduction of categories provided a more concise result set and reduced the variability within the data. Additionally, for the analysis of this variable, any record marked as "unknown" was treated as "not married".

Based on the data presented in Table 16 of donors who had contributed more than \$100, the number of married constituents was more than double the number of unmarried constituents in the same group.

Table 16

Giving Group Segmented by Marital Status

Marital Status	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
Not Married	8,536	81.9%	1,083	10.4%	809	7.8%
Married	5,794	60.5%	1,759	18.4%	2,019	21.1%

(F(1,19998)= 1205.838, p = .000)

A one-way analysis of variance was conducted to confirm the strength of the relationship between donor and marital status; the results confirmed the presence of the relationship reported in the Table 17. Since there were fewer than three groups, no post-hoc analysis was necessary. This study found that nearly 40% of constituents identified as married had made a gift, which is nearly double the 20% of unmarried or single constituents who had made a gift. Similar studies have consistently concluded that being married typically increases the probability of giving (Mesch et al., 2007). When controlling for gender, it was found that approximately 64% of married men had previously donated to their alma mater, while only 57% of married women had previously donated to their alma mater. A review of literature conducted by (Mesch, 2009) found that, overall, “single men and women exhibit different tendencies toward giving as well as married individuals” (p. 5). This observation is consistent with the data

gathered in this study when looking at giving by gender, but the surprising observation is the difference in giving behavior by gender when married. Mesh (2009) explains that:

When decisions were made jointly, husbands had more influence over their wives in deciding on charitable giving. However, they found that education and income were the primary determinants of control over charitable resources—being the primary earner strengthens one's bargaining power in marriage as does the husband's education relative to the wife's. (p. 5)

Therefore, it can be reasoned that the higher propensity of married men that give could be attributed to the influence held as a result of their income and education. Such a conclusion cannot be verified by the data gathered for this study, but future research should be conducted to investigate the role of education and income in resolving philanthropic decisions within a marriage.

Extracurricular Activities

To construct the variable used to define extracurricular activities, any individual who participated in intercollegiate athletics, Greek membership, or any registered student organization was considered as having participating in extracurricular activities. Based on the data presented in Table 17, 68.7% of constituents identified as engaged in extracurricular activities had never made a gift, which is less than the total population of 71.3% of donors that have never given to their alma mater.

A one-way analysis of variance was conducted to confirm the strength of the relationship between donor status and participation in extracurricular activities. The results confirmed the presence of the relationship reported in Table 17. Since there were fewer than three groups, no post-hoc analysis was necessary.

Table 17

Giving Group Segmented by Extracurricular Activities

Participation	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
No	9,495	73.3%	1,749	13.5%	1,718	13.3%
Yes	4,835	68.7%	1,093	15.5%	1,110	15.8%

(F(1,19998)= 46.676, p = .000)

It was found that 31.3% of constituents identified as engaged in extracurricular activities had made a gift. Social identification theory would emphasize that the relationship constructed within these various sub-cultures of the institutions reinforce the connection to the institution and provide an opportunity for fundraisers to engage alum using these subcultures as a means of engaging and soliciting donation that may be specifically directed towards these undergraduate populations. Miller and Casebeer (1990) found alumni that participated or engaged in extracurricular activities as undergraduates were more likely to have higher degrees of satisfaction with their alma mater than alumni that did not participate in any undergraduate extracurricular activities. This builds upon the premise of social identification theory, which states that a person's affiliation with a group can be based on the perception that their actions and outcomes are interconnected with the group; alumni may intimately experience the "success and failures" of the group, or alumni may adopt the group's values and norms. Extracurricular activities enhance the undergraduate experience and help to create a body of experiences from which fundraisers may implement strategies associated with relationship marketing,

which seeks to continually cultivate and reinforce positive relationships with donors. Participation in extracurricular activities as an undergraduate can also serve as a secondary measure mechanism of evaluating undergraduate experience satisfaction when other data are unavailable. A study conducted by Drew-Branch (2011) found a positive relationship between engagement in extracurricular activities as an undergraduate and corresponding satisfaction with their undergraduate experience, which also resulted in a greater likelihood of being an alumni donor. The logistical regression analysis conducted for this study found results consistent with Drew-Branch (2011), where the calculated beta value of .254 indicates a positive relationship between extracurricular activities and donor status and a positive relationship between extracurricular activities and donor status.

Alumni Event Attendance

If an individual attended any type of alumni event, they were coded as having attended an alumni event. Various types of categories were considered alumni events, including, but not limited to, homecoming, presidential, or reunions. Based on the data presented in Table 18, 49.6% of constituents identified as attending an alumni event had never made a gift, which is less than the total population of 71.3% of donors who had never given to their alma mater. With over 50% of individuals who attend events having made a donation to their alma mater, further investigation of the strength of relationship between alumni event attendance and donor status was investigated.

A one-way analysis of variance was conducted to confirm the strength of the relationship between donor status and alumni event attendance. The results confirmed the presence of relationship reported in the Table 18. Since there are fewer than three

groups, no post-hoc analysis was necessary.

Table 18

Giving Group Segmented by Alumni Event Attendance

		Recoded (Final) Giving Group					
		Never Given		\$1-\$99		\$100 or more	
		Count	Row N %	Count	Row N %	Count	Row N %
Alumni Event	No	13,146	74.6%	2,353	13.4%	2,112	12.0%
Attendance	Yes	1,184	49.6%	489	20.5%	716	30.0%

(F(1,19998)= 673.612, p = .000)

Social identification and relationship-marketing theory suggest that an alum's positive relationship with their alma mater reinforced through institutional outreach could create a deeper and more meaningful connection with their alma mater. Prior studies, including Lindahl and Winship (1992) and Pearson (1999), found that alumni attendance at university-sanctioned events was a strong catalyst in encouraging alumni to financially contribute to their alma mater. Over 50% of the donors sampled for this study had attended some type of alumni event sanctioned by the institution. Attending alumni events is an excellent opportunity for the institution to share and communicate their core values, strategic plans, and recent accomplishments to alumni. Sun et al. (2007) reached similar conclusions in determining a statistically significant relationship between alumni attendance and donor status. Sharing these messages with alumni is a vital mechanism in enhancing the existing relationship with the institution by deepening their commitment and perception of "belonging" to the group. In addition, these activities provide strategic partnering, alliances, and friend-raising opportunities that are all strong mechanisms to

establishing relationships that may lead to future financial contributions to an alma mater. The importance of alumni attendance as derived from the calculated beta values that constructed the predictive model was only outperformed by “college affiliation.” Thus, for this Midwest institution, alumni attendance at institutionally sanctioned events is an important aspect in identifying and cultivating potential donors.

Undergraduate Housing

Any constituent who resided in any undergraduate resident hall while an undergraduate was identified with a 1. Based on the data presented in Table 19, over 50% of individuals who lived in undergraduate housing had made a financial donation to their alma mater.

Table 19

Giving Group Segmented by Undergraduate Housing

Undergraduate housing	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
0	13,921	73.0%	2,660	14.0%	2,486	13.0%
1	409	43.8%	182	19.5%	342	36.7%

($F(1,19998) = 379.734, p = .000$)

A one-way analysis of variance was conducted to confirm the strength of the relationship between donor status and undergraduate housing. The results confirmed the presence of relationship reported in the Table 19. Since there were fewer than three groups, no post-hoc analysis was necessary.

Based on the data presented in Table 19 and the computed predictive model, undergraduate housing and donor status had a positive relationship. This positive relationship suggests that if an individual lived in university sanctioned housing during their undergraduate years, their likelihood of making a financial contribution to their alma mater increases. The relationship between undergraduate housing and donor status, when examined through the theoretical framework of relationship marketing and social identification, begins to uncover the underlying reasons for the strong relationship. Previous studies (Foubert et al., 1998; Astin, 1984; Chickering, 1975) found that all students living in university-owned housing during their undergraduate years reported a much higher degree of satisfaction with their overall undergraduate experience than those students who did not live in undergraduate housing. These high levels of satisfaction can explain the positive relationship between undergraduate housing and donor status, because the “group living situations, social activities, and academic environments” (Foubert et al., p. 41) create opportunities for fundraisers to reconnect with these undergraduates using a variety of mechanisms, such as affinity groups, dorm reunion classes, and social clubs that a person would identify as supported by the tenets of social identification theory. Social identification theory states: “an individual may perceive familial or emotional ties with an organization or group that is akin to that of a parental or other forms of personal relationships” (Mann, 2007). For this mid-western institution of higher learning, undergraduate housing was an essential factor in predicting and identifying donor status.

Ethnicity

The data governing ethnicity provided by the institution for this study required a reduction of categories as some defined ethnicity groups had less than 10 individuals. Therefore, the following groups were created: African American, Caucasian, other, and unknown. Based on the data presented in Table 20, the only group that had a lower percentage of individuals who had never given to their alma mater was tCaucasian. All other ethnicity groups had higher percentages of donors that had never given, but the number of individuals within the Caucasian group is significantly more than the other groups. To better investigate the strength of relationship between ethnicity and donor status, a one-way analysis of variance was conducted.

Table 20

Giving Group Segmented by Ethnicity

	Recoded (Final) Giving Group					
	Never Given		\$1-\$99		\$100 or more	
	Count	Row N %	Count	Row N %	Count	Row N %
African American	651	75.6%	127	14.8%	83	9.6%
Caucasian	12,754	70.8%	2,612	14.5%	2,659	14.8%
Other	738	83.7%	77	8.7%	67	7.6%
Unknown	187	80.6%	26	11.2%	19	8.2%
(F(1,19925)=13.454, p = .000)						

A one-way analysis of variance was conducted to further investigate the relationship between donor status and ethnicity. The results confirmed the presence of a relationship reported in the Table 20. Since there were more than two groups, a post-hoc

analysis was conducted. The result of that analysis, reported in Table 21, confirms that the Caucasian group, while similar to the African American group, was significantly different than the Other and Unknown groups, suggesting that the Caucasian group was more likely to be donors than the other groups.

Table 21

Tukey Post-Hoc of Ethnicity and Donor Status ANOVA

Ethnicity		Mean Difference (I-J)	Sig.
Caucasian	African American	.09964 [*]	.000
	Other	.20072 [*]	0.000
	Unknown	.16408 [*]	.003
African American	Caucasian	-.09964 [*]	.000
	Other	.10107 [*]	.019
	Unknown	.06444	.625
Other	Caucasian	-.20072 [*]	0.000
	African American	-.10107 [*]	.019
	Unknown	-.03663	.903
Unknown	Caucasian	-.16408 [*]	.003
	African American	-.06444	.625
	Other	.03663	.903

^{*}The mean difference is significant at the 0.05 level.

The results of this study found that individuals who identified as Caucasian were more likely to be donors to their alma mater than other groups identified. While, these results are specific to the Midwest institution from which the data were drawn, it is not entirely consistent with data assessing the philanthropic power of various ethnic groups. These results cannot correct for factors that may be important in regard to assessing

philanthropic propensity of any cultural group. This study found that African Americans were more likely to be non-donors than donors; however, their giving may be provided to the institution through secondary channels such as direct gifts to students, scholarships through churches, or monies directed through a group initiative or foundation. Floyd (2008) found that “The church is the single most important focal point of giving in the Black community as about 75 percent of giving is channeled through it” (p. 421). This speaks to the importance of social identification as a theory and can explain the giving behaviors of various cultural and ethnics groups. Social identification theory suggests that individuals generally construct groups based on their own personal characteristics as well as social or cultural affiliations. While the church may represent an important social and cultural affiliation for African-American alumni, it is not realistic to try and include such variables for every ethnic and cultural group that may be identified in an organizational or institutional database. While race and ethnicity may be enticing variables to include in predictive models, they cannot account for the overall cultural norms or giving habits of a specific ethnic group. When including variables such as ethnicity, it would be beneficial if additional data were available to capture donations to the university through auxiliary channels, such direct gifts to students, churches, or groups. These additional data points could significantly alter the number of donors calculated, improve the number of donors that would be represented by underrepresented population, and improve the quality of the predictive model. The negative correlation ethnicity has to donor status is explained by the fact that any group apart from the Caucasian group is likely not to be a donor and thus reduces the probability of being a future donor. I must emphasize that such findings are unique to this institution and should not be inferred to all institutions of

higher education as the variance within these variables can be significantly affected by regional, cultural, and institutional policies of a particular institution.

Gender

A preliminary analysis of gender did not yield any significant results that warranted additional investigation. Despite literature that found gender to be a significant factor for many studies it did not prove to be significant for the sample provided for this study. The percentage of non-donors for both genders was near identical differing only by .3%. The number of donors in each was comparable based on the number of records for male and female constituents.

Table 22

Giving Group Segmented by Gender

		Recoded (Final) Giving Group					
		Never Given		\$1-\$99		\$100 or more	
		Count	Row N %	Count	Row N %	Count	Row N %
Gender	F	8,247	71.8%	1,755	15.3%	1,487	12.9%
	M	6,083	71.5%	1,087	12.8%	1,341	15.8%

Surrounding States

The proximity to campus that was investigated in the “Distance from Campus” variable was based on the distance in miles that an individual resided from their alma mater. While this variable was necessary to understand the relationship between distance and donor behavior, it was not sufficient to investigate the relationship of living in an adjacent State to Illinois and being a donor. To investigate this possible relationship, all constituents who lived outside of Illinois were selected, and only constituents who lived

in Indiana, Iowa, Missouri, and Wisconsin were marked as true. The number of non-donors that lived within adjacent states to Illinois was less than the grand population of 71.7% of donors that had never given.

A one-way analysis of variance was conducted to further investigate the strength of the relationship between donor status and living within an adjacent state. The results of the ANOVA ($F(1,6715) = 39.885, p = .000$) confirmed a statistically significant relationship between the variable surrounding states (which identified individuals living within adjacent states) and donor status. Since there were fewer than three groups, no post-hoc analysis was necessary, while statistical significance was found between the two variables. This significance did not extend into the calculated regression model, thus excluding this variable from further analysis.

Correlation Coefficients

Cohen (1998) suggests that the absolute value of correlation coefficients can be categorized as small (.10 - .29), medium (.3-.49), and large (.5 and 1.00). Using those definitions, the analyzed variables were categorized as they related to donor status.

Small: The business phone, number of kids, volunteer status, marital status, alumni event participation, undergraduate housing.

Medium: Degree Year Group, Age Group.

Large: No variables met the criteria for this group.

Uncategorized: Distance from ISU, Professional designation (Factor Doctor), College of Business, College of Nursing, Participation, Ethnicity.

Research Question One: Logistic Regression Analysis

To determine the predictive influence of the variables selected for this study, a binary logistic regression model was conducted using SPSS. The purpose of this

statistical test was to identify the variables that best construct the model that predicted the likelihood of being a donor. The variables identified in the previous section were used as the factors to be evaluated for the model. The model was developed using three steps representing the categories used to organize the variables: demographic, connectedness, and alumni experience. Evaluating the effectiveness of the logistical model was influenced by Chao-Ying et al. (2002), which suggested that one must attend to (a) overall model evaluation, (b) statistical tests of individual predictors, (c) goodness-of-fit statistics, and (d) validations of predicted probabilities (p.5).

Overall Model Statistics

The calculated chi-square of the overall model was 20289. The Nagelkerke r-Square, a statistic meant to emulate the purpose of the traditional r^2 statistic measuring the amount of variance explained in the dependent variable by the independent variable, was .234. This suggests that 23% of the variance associated with being a donor can be attributed to the variables included in the model. The r-square value reported that low was not sufficient cause for concern, as this type of data mining practice is largely exploratory, representing a systematic approach to predicting donor behavior based on available data. Therefore, the r-square value should not be used as a sole means of measuring the utility of the calculated model. The classification percentage that measured the model's accuracy to classify/predict a selected amount of cases from the sample population was calculated at 75%. Specifically, this model was able to correctly classify non-donors with a calculated success rate of 92.5%, while correctly classifying donors with a 30% success rate. The hosmer and lemeshow test for goodness of fit was statistically significant, with a chi-square valued of 69.97 (df = 8).

Individual Predictors

The model was developed using three steps that represented the categories used to organize the variables: demographic, connectedness, and alumni experience. During the multiple step process, some predictors became insignificant, specifically, gender and surrounding states, which were removed from the final model. The beta values reported for alumni event participation, volunteer participation, and graduation from the nursing school all had positive effects on the likelihood of being a donor, as shown in Table 23.

Table 23

Significant Factors in Predicting Donor Status

	B	S.E.	Wald	df	Sig.	Exp(B)
Ethnicity	-0.123	0.037	10.854	1	0.001	0.884
Distance from campus	0.143	0.018	60.956	1	0	1.154
Extracurricular activities	0.254	0.037	46.318	1	0	1.289
College of Business	0.282	0.044	40.544	1	0	1.326
Graduation Year	0.308	0.05	37.459	1	0	1.361
Business phone	0.343	0.042	66.995		0	1.409
Marital status	0.347	0.039	78.422		0	1.415
Professional designation	0.385	0.117	10.731		0.001	1.469
Undergraduate housing	0.391	0.076	26.784		0	1.479
Number of children	0.427	0.044	95.381		0	1.533
Constituent age	0.48	0.051	89.76	1	0	1.616
Participation volunteer	0.692	0.116	35.463	1	0	1.998
Alumni Event Attendance	1.008	0.051	387.841	1	0	2.741
College of Nursing	1.212	0.128	88.941	1	0	3.36
Constant	-2.770	.054	2626.30	1	0.000	.063

$$\begin{aligned} \text{Donor probability} = & (\text{Graduation Year} * 0.308) + (\text{Ethnicity} * -0.123) + \\ & (\text{Distance from campus} * 0.143) + (\text{Extracurricular activities} * 0.254) + (\text{College of} \\ & \text{Business} * 0.282) + (\text{Business Phone} * 0.343) + (\text{Marital status} * 0.347) + \\ & (\text{Professional designation} * 0.385) + (\text{Undergraduate housing} * 0.391) + (\text{Number of} \\ & \text{kids} * 0.427) + (\text{Constituent age} * 0.48) + (\text{Participation volunteer} * 0.692) + (\text{Alumni} \\ & \text{Event Attendance} * 1.008) + (\text{College of Nursing} * 1.212) + (-2.77) \end{aligned}$$

Model Validation

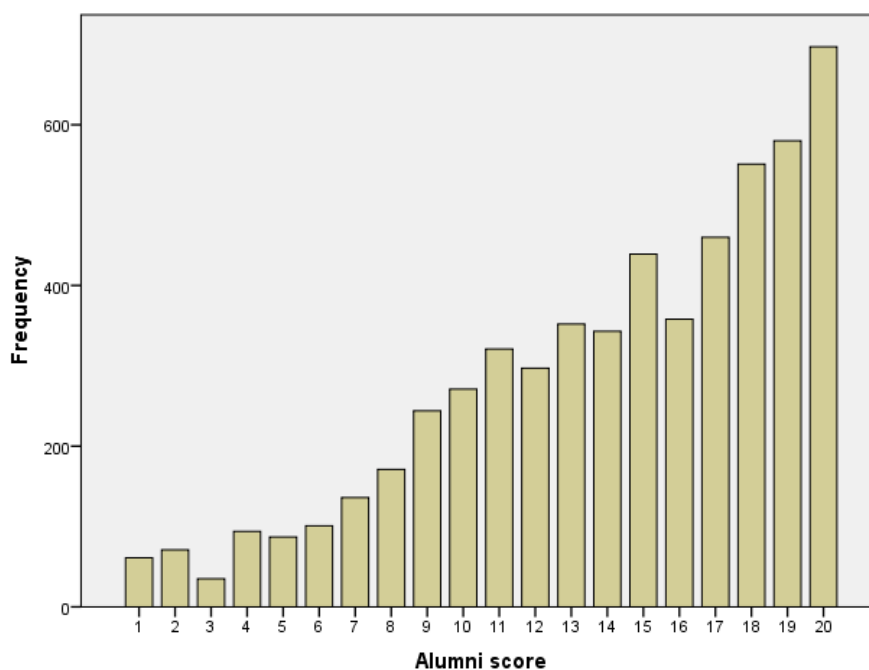
To validate the model and its ability to predict donor status, the calculated probability based on the beta values derived from binary regression analysis reported in Table 23 were arranged into percentiles of 20 groups. The higher the percentile number, the greater the likelihood of being a donor. After calculating the percentile group for all records, a frequency table was generated for records where the real donor status was “true” that provided an opportunity to confirm if actual donors clustered to the higher percentile numbers, thus providing a secondary means of validating the predictive accuracy of the model. The data reported in Table 24 show that over 50% of all donors were found to be in the top six percentile groups. The percentile groups with the most donors were 19 and 20, representing the donors with the highest probability. This technique of model validation was first used by Wiley (2004) and has been an effective tool in creating scores that are more meaningful and interpretable by professional fundraisers as a result of the reduced complexity and segmentation of constituents into rank order based on percentile score.

Table 24

Percentile Analysis

Percentile Group	Frequency	Cumulative Percent
1-14	2,585	45.6
15	439	53.3
16	358	59.6
17	460	67.8
18	551	77.5
19	580	87.7
20	697	100.0
Total	5,670	

The distribution of donors shown in Figure 2 provides additional evidence of the strength of the model as the increasing amount of donors that appear toward the higher end of the percentile groups.

*Figure 2. Alumni Score Distribution*

Overview of First Time Gift

The data provided by the participating institution contained 20,000 records for analysis. The “first time gift amount” variable was a calculation of the amount of money donated by a specific constituent to the institution for the first gift. In reviewing the first time gift variable, it was observed that only 28% of individuals in the sample had available data for this field. To manage the range of gifts associated with the variable, three groups were created based of approximately equal populations. The three calculated groups were first time gifts between “\$.01-\$19.99”, “\$20.00-24.99, and \$25 or more. Creating three groups aided in interpreting results and provided a mechanism of segmentation that prioritized the donor based on the predicted value of their first gift. For the purpose of this variable, annual level donors were individuals who had made their first gifts between “\$.01-\$19.99”, “\$20.00-24.99, and “\$25” were considered major level donors. These categorizations were not identical to those of the institution of study, because the data provided by the institution for analysis did not contain sufficient records to accurately reflect the total population of annual and major level donors, which for the institution included corporations and other non-human legal entities that were beyond the scope of this study. The data depicted in Table 25 show the number of constituents that comprised each group as calculated by the “first time gift” variable.

Table 25

First Time Giving Group

	Frequency	Percent	Valid Percent	Cumulative Percent
\$.01-\$19.99	2241	39.6	39.6	39.6
\$20.00-\$24.99	1572	27.8	27.8	67.3
\$25+	1849	32.7	32.7	100.0
Total	5662	100.0	100.0	

Research Question Two: Variable Analysis

What variables are most likely to predict amount of money alumni will contribute to their alma mater was investigated using descriptive statistics, custom tables showing the counts of donors that fell into each first time giving group by factor, and then using a correlational analysis to test the strength of the relationship between the investigated factors and the first time giving group variable. Only the variables that were found to have a significant relationship with the first time giving group were analyzed in depth. Multiple variables were found to have a significant relationship with the variable first time giving group. The relationship and strength of the variable in the calculated logistical regression model will be discussed in detail.

Table 26

Independent Variables Associated with Demographic Information

Name	Scale	Description
Professional designation	Nominal	PhD, Professional, or Military designation.
Marital Status	Nominal	Whether an alum is listed as married or single
Number of kids	Interval	The number of children associated with alum
Distance from alma mater	Interval	Distance in miles between the alumni house and alma mater.
Live in residence hall	Nominal	
Graduation Year	Nominal	
Attended alumni events	Nominal	
College of Business Graduate	Nominal	
Business Phone	Nominal	

Professional Designations

Advanced degrees or professional designations can be an indicator of an individual's area of employment or academic achievement, which are both factors that prior literature, including Sun et al. (2007), suggests will have a relationship with the likelihood of a donor to contribute to their alma mater. Due to the coding mechanisms used by the institution, individuals who have earned a M.D. or PhD were used to investigate the relationship between professional designation and donor status. In Table 27, the relationship between first time giving group and professional designation shows that nearly half of individuals with a professional designation tend to make their first gift at the highest level of the first time giving group of "\$25+".

Table 27

First Time Giving Group Segmented by Professional Designation

Professional designation	First Time Giving Group					
	\$.01-\$19.99		\$20.00-\$24.99		\$25+	
	Count	Row N %	Count	Row N %	Count	Row N %
Others	2,198	40.1%	1,524	27.8%	1,761	32.1%
Doctors	43	24.0%	48	26.8%	88	49.2%

A correlation analysis was conducted to further investigate the relationship between professional designation and first time giving. The computed Pearson product-moment correlation was a significant positive correlation between the two variables, $r=.068$, $n= 5658$, $p=.000$. Additional analysis of this variable is provided in conjunction with business phone in the next section.

Business Phone

The data shown in Table 28 show the presence of a business phone had a marginal increase of 2.9% in regard to the number of records in the highest first time giving group of “\$25+.”

Table 28

First Time Giving Group Segmented by Business Phone

Business Phone	First Time Giving Group					
	\$.01-\$19.99		\$20.00-\$24.99		\$25+	
	Count	Row N %	Count	Row N %	Count	Row N %
Unknown	1,560	39.6%	1,127	28.6%	1,250	31.8%
Present	681	39.5%	445	25.8%	599	34.7%

A correlation analysis was conducted to further investigate the relationship between business phone and first time giving. The computed Pearson product-moment correlation was a positive correlation between the two variables, $r=.017$, $n= 5658$, $p=.10$.

Advanced degrees or professional designations can be an indicator of an individual's area of employment or academic achievement, which are both factors the literature suggests will have a relationship with donor likelihood to contribute to their alma mater. Clotfelter (2001) asserts that income is highly correlated with total contribution, which this study confirms. It is important to note that due to the coding mechanisms used by the institution, individuals who had earned a M.D. or PhD were used to define professional designation and the possible relationship with the first time giving group. The relationships between first time giving group and professional designation shows that nearly half of the individuals with a professional designation tend

to make their first gift at the highest level of the first time giving categorization of “\$25+”. The same pattern was found with business phone, as the presence of a business phone had a marginal increase of 2.9% in regard to the number of records in the highest first time giving group of “\$25+”. If alternative variables had been requested that defined employment status beyond professional designation and the presence of a business phone, it may have led to a larger number of individuals and donors within these groups and increased the strength of relationship between these variables and first time giving group. It can be surmised, based on prior literature and the trend discovered in this study of employment as analyzed through professional designation and the presence of a business phone, that these variables would have contributed to a greater amount of variance within the first time giving group. However, this study provided insight for fundraisers of this institution to continue to find ways to accurately determine employment status as it has tangible benefits to enhancing the predictive power of models constructed to gauge donor potential.

Alumni Event Attendance

If an individual attended any type of alumni event they were coded as having attended an alumni event. Various types of categories of including but not limited to homecoming, presidential, or reunions were considered alumni events. Based on the data presented in Table 29 the increase of 7.8% of individuals who have participated in extracurricular activities at the highest first time giving group of “\$25+” is greater than the percentage differences of the other first time giving groups of \$.01-\$19.99 (-2.1%) and \$20.00-\$24.99 (-5.7%).

Table 29

First Time Giving Group Segmented by Alumni Attendance

Alumni attendance	First Time Giving Group					
	\$\$.01-\$19.99		\$20.00-\$24.99		\$25+	
	Count	Row N %	Count	Row N %	Count	Row N %
No	1,819	40.8%	1,259	28.2%	1,383	31.0%
Yes	422	35.1%	313	26.1%	466	38.8%

A correlation analysis was conducted to further investigate the relationship between alumni event attendance and first time giving. The computed Pearson product-moment correlation was a significant positive correlation between the two variables, $r=.065$, $n= 5658$, $p=.000$. Dolbert (2002) discussed the importance of alumni attending institutionally sanctioned events as a means of reconnecting and reinforcing the values that would entice alumni to make a financial contribution to their alma mater. This study confirms such findings and its utility for this institution in predicting not only the likelihood of becoming a donor, but also providing predictive significance to the amount of money an alum is likely to pledge as their first gift. It could be reasoned that the low attendance across the board speaks to a low level of social identification, as alumni do not consider themselves a part of the group(s) hosting/coordinating these events. However, this variable does not take into account events that do not have an official registration nor events that are organized outside of the alumni relations office, but heavily attended by alumni. If the attendees of these events could be captured, the significance of this variable and the recorded number of events attendees would likely increase significantly.

Undergraduate Housing

Based on the data presented in table 31, 46.8% of individuals that lived in residence halls during the undergraduate years made their first gift at the lowest first time giving group of “\$.01-\$19.99”. Additionally, it is important to note that in all other categories of the first time giving group variable “\$20.00-\$24.99” and “\$25+”, those who did not live in residence halls had higher percentages of donors 27.9% and 33.3% respectively in those groups.

Table 30

First Time Giving Group Segmented by Residence Hall Status

Residence hall status	First Time Giving Group					
	\$.01-\$19.99		\$20.00-\$24.99		\$25+	
	Count	Row N %	Count	Row N %	Count	Row N %
No	1,996	38.8%	1,434	27.9%	1,709	33.3%
Yes	245	46.8%	138	26.4%	140	26.8%

A correlation analysis was conducted to further investigate the relationship between undergraduate housing and first time giving group. The computed Pearson product-moment correlation was a significant negative correlation between the two variables, $r = -.005$, $n = 5658$, $p = .000$. If an individual resided in any undergraduate resident hall while an undergraduate, their record was identified with a 1. For many colleges it is mandatory that undergraduate students live in residence halls during their first year in college, so it is surprising that so few individuals had been coded as living in undergraduate housing. To further understand this discrepancy, an email was sent to the

institution to help clarify the likely reasons for this data anomaly. The response was that during various conversions from various systems and the initial shift to an electronic database, certain aspects of student data were not retained. Therefore, only a small percentage of alumni records, as compared to the entire alumni population, actually had undergraduate housing data associated. While at this point there are few alumni with the undergraduate housing information associated with their record, it is likely in the future that this number will increase as will the potential significance of the variable in the model. The value of the undergraduate housing variable in any predictive model is best understood when examined through the social identification theory. The familiar and collegial bonds developed as a result of living in undergraduate housing serve as a means of providing fundraisers a frame of reference from which to draw stories, relationships, and significant events in tailoring messaging towards alumni.

Distance from Campus

The distance in miles that constituents reside from the main campus may influence the number of communications (mail, email, etc.), event invitations, and face-to-face contact with university officials. This variable was analyzed because of the potential that distance may have on the strength of the relationship with the institution influencing the possibility of a constituent being a donor. To analyze the possible relationship between distance (in miles) and donor status, four groups were created. Three of the groups were constructed to have approximately 33% of the constituents with known addresses, while the fourth represented individuals with no known address. Table 31 indicates that the largest groups of individuals to give at the highest level of “\$25+” of first time giving were likely to live within 1-87 miles and 125+ miles of the institution.

Table 31

First Time Giving Group Segmented by Distance from Campus

Distance from institution	First Time Giving Group					
	\$.01-\$19.99		\$20.00-\$24.99		\$25+	
	Count	Row N %	Count	Row N %	Count	Row N %
Missing Data	61	45.2%	36	26.7%	38	28.1%
1-87 miles	750	39.2%	532	27.8%	631	33.0%
88-124 miles	649	40.5%	460	28.7%	495	30.9%
125+ miles	781	38.9%	544	27.1%	684	34.0%

A correlation analysis was conducted to further investigate the relationship between distance from campus and first time giving. The computed Pearson product-moment correlation was a positive correlation between the two variables, $r=.013$, $n=5658$, $p=.165$. The distance in miles that constituents reside from the main campus may increase the number of communications (mail, email, etc), event invitations, and face-to-face contact with university officials. The results of this study suggest that most donors reside within 87 miles of campus or they live 125+ miles from campus, which supports findings of many studies, which conclude that donors generally live closer to their alma mater, while Beeler (1982) found that alumni who live furthest from campus were more likely to be donors. It is likely that the significance of this variable will differ greatly among institutions and is highly correlated to the execution of the institutional marketing and communication strategy. The assumption with this variable is that the closer alums live to their alma mater, the easier it is to establish a relationship with various agents of the institution. Since fewer barriers exist for alumni to attend events and maintain close

and personal relationship with various agents of the institution, it becomes easier to implement strategies based on the theoretical framework of relationship-marketing theory. The core goal of this theory is the continual cultivation and reinforcement of positive relationships with donors, which speaks to the reliance upon physical proximity to the institution. The ability of an institution to commit financial resources to ensure that institutional agents are able to travel, communicate, and market to alumni at great distances from the institution are likely factors that will influence the significance of this variable “distance from campus” with various predictive models.

College of Business Graduate

The academic discipline in which an individual attains their degree was identified by prior literature as having a relationship with the donor status of an individual. The data presented in Table 32 show an increase of 3.9% of individuals who graduated from the College of Business and made their first gift at the highest level of the first time giving group at “\$25+.” Graduates from other colleges of the institution gave at higher amounts at the two lower levels of the first time giving group variable at “\$.01-\$19.99” and “\$20.00-\$24.99.”

Table 32

First Time Giving Group Segmented by Business School Graduate

College of Business graduate	First Time Giving Group					
	\$.01-\$19.99		\$20.00-\$24.99		\$25+	
	Count	Row N %	Count	Row N %	Count	Row N %
No	1,811	40.0%	1,273	28.1%	1,442	31.9%
Yes	430	37.9%	299	26.3%	407	35.8%

A correlation analysis was conducted to further investigate the relationship between College of Business graduates and first time giving variable. The computed Pearson product-moment correlation was a significant positive correlation between the two variables, $r=.029$, $n= 5658$, $p=.015$. The academic discipline in which an individual attains their degree was identified by prior literature as having a relationship with the donor status of an individual. The earning power of those who graduate with a business degree is generally higher than most majors, excluding those that deal with science, engineering, technology and math (Adams, 2013). The significance of a single college in this study may reflect the aforementioned “earning power” or be a result of the number and effectiveness of fundraisers for a particular college. Colleges that encompass majors that produce alumni in high potential earning careers and have dedicated fundraising staff members who are able to secure various levels of financial gifts will certainly influence the significance of a single college within a predictive model. The significance of the College of Business within this model is likely a result of the earning power of alumni from that college and the effectiveness of fundraisers to ensure that alumni continue to identify with the institution and leverage the ability to convert that relationship through marketing campaigns and personal communication into contributions to their alma mater.

Graduation Year

The degree year of constituents was segmented based on percentile analysis into three groups, with each group containing approximately 33% of the total population. The trend revealed in Table 33 is that most recent graduates are likely to have donated at the highest level of “\$25+,” and as the graduation year increases, the likelihood of making the first gift at the highest level of “\$25+” decreases. The same trend is duplicated for the

“\$20.00-\$24.99” group of the first time giving variable. At the lowest level group of the first time giving variable “\$.01-\$19.99” as the degree year decreases the number of individuals in this group increases.

Table 33

First Time Giving Group Segmented by Graduation Year

Graduation year	First Time Giving Group					
	\$.01-\$19.99		\$20.00-\$24.99		\$25+	
	Count	Row N %	Count	Row N %	Count	Row N %
1952-1985	1,363	45.9%	730	24.6%	879	29.6%
1986-1999	655	33.7%	590	30.3%	700	36.0%
2000-2013	223	29.9%	252	33.8%	270	36.2%

A correlation analysis was conducted to further investigate the relationship between degree year and first time giving. The computed Pearson product-moment correlation was a significant positive correlation between the two variables, $r=.111$, $n=5658$, $p=.000$. Prior studies by Key (2001) and Sargeant (1999) are consistent with the results of this study that found as donors become older they are more likely to give. However, this likelihood to give is likely based on the notion that those alumni have already made prior gifts. Thus, as those alumni continue to give, they are also likely to increase the monetary value of their gift. In contrast to predicting the “likelihood of making a gift,” when predicting the “amount of the first gift,” as alumni get older and have never made a prior gift to their institution, the size of that first gift decreases. The reasons for this decrease could be attributed to many factors, but is it likely that these individuals may have never “socially identified” with the institution and thus prevented

fundraisers from effectively leveraging those social connections into marketing strategies and campaigns. Young alumni who are new or recently graduated will have more current relationships with various agents of the university that can be capitalized upon by institutional fundraisers. Social identification theory, when applied to young graduates, creates an opportunity for fundraisers to reference and reinforce the recent experiences and the group's values and norms as a base from which to create the relationship-based marketing campaigns. These relationship-based marketing campaigns would more widely appeal to younger graduates who have a more current perspective and relationship with the institution. Therefore, it would be much easier to secure a gift at any level, but certainly at the higher levels from recent graduates as opposed to older graduates who have never given and whose values and norms that were prevalent during their tenure may have changed or ceased to exist in the current social climate of their alma mater.

Marital Status

The data provided by the institution identifying marital status originally held nine distinct categories. For the purposes of this study, those nine groups were reduced into two groups of "not married" and "married". The reduction of categories provided a more concise result set and reduced the variability within the data. Additionally, for the analysis of this variable, any record marked as "unknown" was treated as "not married". The trends revealed in Table 34 are that non-married individuals represent the largest group of individuals making their first time gift at the highest levels. Of those individuals not married, 29.3% and 34.2% of that population had given at "\$20.00-\$24.99" and "\$25+" first time giving groups, respectively, in comparison to 27% and 31.9% of the same groups of those who were married.

Table 34

First Time Giving Group Segmented by Marital Status

Marital status	First Time Giving Group					
	\$01-\$19.99		\$20.00-\$24.99		\$25+	
	Count	Row N %	Count	Row N %	Count	Row N %
No	689	36.4%	555	29.3%	648	34.2%
Yes	1,552	41.2%	1,017	27.0%	1,201	31.9%

A correlation analysis was conducted to further investigate the relationship between marital status and first time giving. The computed Pearson product-moment correlation was a significant positive correlation between the two variables, $r=.018$, $n=5658$, $p=.091$. The data provided by the institution identifying marital status originally held nine distinct categories. The trends revealed in Table 34 are that non-married individuals represent the largest group of individuals making their first time gift at the highest levels. However, it was clear that the number of married alumni making gifts was much higher than those alumni who were not married in all categories. Thomas (2005) and Sarunya et al. (2014) reported “a minor but significant relationship between having an alumni spouse and the amount the couple give, but not whether or not they give” (p. 171). The results of this study align with previous studies and build on the notion that life stage, and specifically marriage, may increase the strength of social identification connections between alumni and their alma mater. The increased influence of social identification connections may be a result of the synergetic relationship between social identification and relationship marketing in that these two theories, when effectively executed in various types of marketing and social campaigns targeting

married couples with messages aimed to influence the connectedness with an institution, may entice them to make larger initial gifts when giving for the first time. These practices could be the catalyst that encourages these alums to donate, as their sense of connectedness increases so does their desire to continue to positively engage the institution through financial contributions. This public 4-year Midwestern university has a positive relationship with married alumni, which is reflected in the number of married alumni that have contributed financially to their alma mater.

Number of Kids

The trends revealed in Table 35 are that most families with no children have donated at the highest level of “\$25+” and, as the number of children increases, the number of those families making their first gift at the highest level of “\$25+” decreases. At the lowest level group of the first time giving variable “\$.01-\$19.99”, as the number of children increases so does the number of families making their first time gift at the lowest level.

Table 35

First Time Giving Group Segmented by Number of Kids

Number of kids	First Time Giving Group					
	\$.01-\$19.99		\$20.00-\$24.99		\$25+	
	Count	Row N %	Count	Row N %	Count	Row N %
0 Kids	1,559	37.7%	1,172	28.4%	1,401	33.9%
1-3 Kids	629	44.5%	361	25.5%	424	30.0%
4+ Kids	53	45.7%	39	33.6%	24	20.7%

A correlation analysis was conducted to further investigate the relationship between number of kids and first time giving. The computed Pearson product-moment correlation was a significant negative correlation between the two variables, $r=(-.064)$, $n=5658$, $p=.000$.

The number of children that live in a household will have a significant impact on the amount of money that can be devoted to philanthropic purposes. As the results of this study reveal, individuals with no children are more likely to donate at the highest level, while individual with more than four children are likely to be donating at the lowest levels. One of the limitations of this variable is the lack of information regarding the age of the children, which would provide a more precise means of determining or constructing a life-stage variable indicative of the availability of financial resources for an alum to contribute to their alma mater. A study conducted by Blanc et al. (2009) reported a positive correlation between the number of children and giving, but cautioned that the “real effect on giving is more probably from a higher income level and advanced stage of the life cycle.” While this variable proved significant in the construction of this linear regression model, it should be noted that the underlying factors that construct the variance associated with this variable’s ability to predict giving levels are still very much unknown and require further study in order to fully document the relationship between number of children and the amount of an alum’s first gift.

Multiple Linear Regression Analysis

What factors best predict the amount of money new alumni donors will contribute for their first gift was investigated using multiple linear regression. Multiple linear regression is a technique associated with multivariate analysis that attempts to create an

equation to predict the value of a dependent variable based on the values of multiple independent variables. Vogt (2007) provides an analogy that encapsulates the essence of multiple linear regression, when he states “the independent variables of a multiple regression can be thought of as storytellers, [while] the story is the dependent variable” (p. 168). Independent or predictor variables in regression analysis seek to accomplish two major goals: explain the variance within the dependent variable and provide a statistically significant regression coefficient. The independent variables used for the linear regression model to predict the amount of money of an alum’s first gift were drawn from the variables used in the logistical regression model. To evaluate the strength of the model, analysis of the R-squared value was conducted to determine the best model and the corresponding model statistics were analyzed. The most effective means of evaluating a model was to compare these results with actual data. In an effort to determine the effectiveness of the model, actual data was used to analyze a past donor acquisition campaign to see if it accurately computed the likely range of a donor’s first gift.

Correlation Analysis

The Pearson product correlation coefficient is a measure of the strength of the linear association between two variables. A Pearson product correlation attempts to draw a line of best fit through the data of two variables, and the Pearson correlation coefficient, r , indicates how far away all these data points are to this line of best fit (Leard, 2014). The calculated Pearson product correlation coefficient is reported for all variables in Table 36. All variables were tested at an alpha level of .05; while not all variables were found to be individually significant, when included in the final model became significant.

Table 36

Pearson Product-Moment Correlation Coefficient for First Time Giving Group

Variables	R-Value	Sig.	N
Number of kids	-0.064	.000	5658
Residence hall status	-0.05	.000	5658
Distance From Institution	0.013	.165	5658
Business Phone	0.017	.101	5658
Marital status	0.018	.091	5658
College of Business graduate	0.029	.015	5658
Alumni attendance	0.065	.000	5658
Professional designation	0.068	.000	5658
Graduation year	0.111	.000	5658

Research Question Two: Overall Model Statistics

The linear model calculated to predict the group in which a constituent is likely to make their first gift is $(\text{Business Phone} * 0.05) + (\text{Alumni attendance} * 0.126) + (\text{residence hall status} * -0.103) + (\text{Distance From Institution} * 0.027) + (\text{College of Business graduate} * 0.065) + (\text{Graduation year} * 0.138) + (\text{Marital status} * -0.017) + (\text{Number of kids} * -0.031) + (\text{Professional designation} + .068) + 1.799$, based on data drawn from Table 37.

The calculated R of the overall model was .163, which suggests that %16.3 percent of the variance within the “First time giving” group variable can be explained using the constructed model. While low, the r-square value reported is not sufficient

cause for concern as this type of data mining practice is largely exploratory representing a systematic approach to predicting donor behavior based on available data. Therefore, the r-square value should not be used as a sole mean of measuring the effectiveness of the calculated model.

Table 37

Beta Weights of Predictor Variables in the Linear Regression Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
Professional designation	.335	.064	.069	5.241	.000
Business Phone	.050	.025	.027	2.010	.044
Alumni attendance	.126	.028	.061	4.526	.000
Residence hall status	-.103	.040	-.035	-2.591	.010
Distance From Institution	.027	.013	.028	2.121	.034
College of Business graduate	.065	.028	.031	2.330	.020
Degree Year Group	.138	.018	.115	7.617	.000
Marital status	-.017	.007	-.036	-2.481	.013
Number of kids	-.031	.011	-.039	-2.757	.006
(Constant)	1.799	.035		50.714	.000

Note. Dependent Variable: First Time Giving Group

Model Validation

To validate the model and its ability to predict the amount of the first time gift the calculated probability based on the beta values derived from the multiple linear regression analysis reported in Table 38 were arranged into percentiles of three groups. Each percentile number corresponded with a specific first time giving group, where percentile group 1 represented first time giving group “\$.01-\$19.99”, percentile group 2 “\$20.00-\$24.99”, and percentile group 3 “\$25+”. Each group of the first time gift variable was then analyzed by evaluating how often the model correctly predicted the group.

For individuals in the lowest first time giving group of gifts between “\$.01-\$19.99”, the model correctly predicted 54.9% of the cases as recorded in Table 38.

Table 38

Percentile Group of Predicted First Time Giving Group: \$.01-\$19.99

	Frequency	Percent
\$.01-\$19.99	1230	54.9

For individuals in the second first time giving group of gifts between “\$20.00-\$24.99”, the model correctly predicted 27.7% of the cases as recorded in Table 39.

Table 39

Percentile Group of Predicted First Time Giving Group: \$20.00-\$24.99

	Frequency	Percent
\$20.00-\$24.99	436	27.7

For individuals in the third first time giving group of gifts “\$25+”, the model correctly predicted 34.1% of the cases, as shown in Table 40.

Table 40

Percentile Group of Predicted First Time Giving Group: \$25+

	Frequency	Percent
\$25+	631	34.1

Summary

This chapter presented an overview of the logistical and multiple regression analysis, variable analysis, and model validation techniques used to answer the following research questions:

1. What factors are most likely to predict the likelihood of alumni making a financial contribution to their alma mater?
2. What factors are most significant in predicting the amount of money alumni will contribute to their alma mater?

The results of the logistical regression model constructed for research question one, “What factors are most likely to predict the likelihood of alumni making a financial contribution to their alma mater?” found that the 14 variables used to build the model accounted for 23% of the variance associated with being an alum that financially supports their alma mater for the Midwestern institution selected for this study. The model was developed using three steps representing the categories used to organize the variables: demographic, connectedness, and alumni experience. The variables of alumni event participation, volunteer participation, and graduation from the nursing school all had the

strongest positive beta values on the likelihood of being a donor. To validate the model and its ability to predict donor status, the calculated probability was arranged into percentiles of 20 groups. The higher the percentiles number the greater the likelihood of being a donor. After calculating the percentile group for all records, a frequency table was generated for records where the actual donor status was true, providing an opportunity to verify whether actual donors clustered to the higher percentile numbers, thus providing an additional means of validating the predictive accuracy of the model.

The results of the multi-linear regression model constructed for research question two, “What factors are most significant in predicting the amount of money alumni will contribute to their alma mater” shows that the nine variables used to build the model accounted for 16.3% of the variance associated with the amount of money donated by an alum for their first gift to their alma mater. To validate the model and its ability to predict the amount of the first time gift, the calculated probability based on the beta values derived from multiple linear regression analysis were arranged into percentiles of three groups. Each percentile number corresponded with a specific first time giving group, where percentile group 1 = first time giving group “\$.01-\$19.99”, percentile group 2 = “\$20.00-\$24.99”, and percentile group 3 = “\$25+”. Each group of the first time gift variable was then analyzed by evaluating how often the model correctly predicted the group. For individuals in the lowest first time giving group of gifts between “\$.01-\$19.99”, the model correctly predicted 54.9% of the cases; for individuals in the second first time giving group of gifts between “\$20.00-\$24.99”, the model correctly predicted 27.7%; and for individuals in the third first time giving group of gifts “\$25+”, the model correctly predicted 34.1%.

CHAPTER V

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

Statement of the Problem

In a depressed economic environment with scarce resources to support higher education, predictive modeling may help identify high scoring alumni who are most likely to make a financial contribution. Lara and Johnson (2008) describe a philanthropic environment for higher education divided evenly between organizational and individual giving. Organizational giving is comprised of various entities such as foundations, corporations, religious and other organizations, while the remaining gifts are from individuals. Thirty-five percent of individual giving is attributed to alumni contributions (Lara & Johnson, 2008), thus it becomes imperative that institutions of higher education be able to identify high potential alumni donors with greater accuracy and efficiency. Fundraising has a significant role in the economic health of an institution of higher education and, without sufficient financial investment from private sources such as alumni, friends of the institutions, and corporate gifts, it becomes exceedingly difficult for institutions to operate without sacrificing the services and quality provided by the institution. Fundraising has become a primary mechanism in offsetting the reduced funding provided by state and local governments, while allowing the university to avoid raising costs such as tuition (Hauptman, 1997) and student fees. As higher education is increasingly seen as a mechanism in upward mobility, it requires institutions to address

the “growing gap between resources and expectations (Hauptman, 1997, p. 29). As changes in state and government funding continue to affect the financial health of higher education, universities are increasingly relied upon to fulfill expectations of various constituency groups. It becomes imperative that institutions find new methods and techniques to help identify potential donors and reliably predict the expected amount of donations from each individual constituent. Worth (1993) describes that understanding donor behavior and motivation are “crucial to the practicing fundraiser” (p. 31). While, studies suggest various factors that may contribute to alumni giving, such gender, wealth, and various demographic variables, competing perspectives suggest age, gender, and marital status are poor predictors of alumni giving (Worth, 1993, p. 33). Other theorists suggest that gender, age, and marital status may be significant predictors of alumni giving (Wiley, 2004; Brittingham, 1990). The distinctiveness of individual institutions of higher education ensures that models developed for one institution may not prove significant for another institution, albeit similarities in mission and alumni. Therefore, research must continue in the field of predictive modeling as it relates to fundraising in higher education so the develop models and analysis may uncover the nuances among institutions and provide a deeper understanding of how various factors influence alumni giving in varying environments of higher education.

Purpose of the Study

The purpose of this study was to enhance the sophistication of identifying and measuring the likelihood of alumni financially supporting a 4-year public Midwest university by using predictive modeling and data mining techniques to help increase the efficiency and financial success of strategic fundraising campaigns and initiatives.

The first two chapters discussed the importance of predictive modeling in higher education and the history of fundraising, theories of fundraising, the anatomy of a donor, and the necessity of the use of predictive modeling in higher education. Predictive modeling is still predominately achieved by most institutions using specialty software and large firms that produce numbers and models without explaining the intricacies or theories pertaining to statistical analysis and methods used to calculate these “alumni scores.” Additionally, there is a lack of scholarly articles that outline the process of predictive modeling for fundraising and advancement professionals to use as a means to build their own models or conduct comparative analysis to measure success, affinity, or other forms of benchmarking figures. To contribute to this emergent field within higher education, the purpose of this study was to enhance the sophistication of identifying and measuring the likelihood of alumni financially supporting a 4-year public Midwest university by using predictive modeling and data mining techniques to help increase the efficiency and financial success of strategic fundraising campaigns and initiatives. To accomplish this goal, this study created two models to answer the following research questions:

1. What factors are most likely to predict the likelihood of alumni making a financial contribution to their alma mater?
2. What factors are most significant in predicting the amount of money alumni will contribute to their alma mater?

This chapter presents a summary and discussion of the findings and recommendations for practical use in higher education, specifically those areas focused on fundraising.

Theoretical Framework

Mann (2007) explains that three theories are well suited for fundraising in higher education as they make for clear and understandable connections: altruism, social identification, and relationship-marketing theory.

Altruism is a key factor well known by fundraisers in higher education as they rely upon it as a mechanism that enhances alumni feelings of connectedness with their alma mater. Specifically, fundraising professionals use this enhanced connectedness to “organize fundraising efforts around such events as reunions, college anniversaries, and campaign goals” (Mann, 2007, p. 38).

Social identification theory suggests that individuals generally construct groups based on their own personal characteristics as well as social or cultural affiliations. Mann (2007) shares four principles that form his theory: (a) a person’s affiliation with a group can be based solely on the perception that their actions and outcomes are interconnected with the group, (b) a person intimately experiences the “success and failures” of the group, (c) an adoption of the group’s values and norms as personal code of conduct and “guiding principles”, and (d) an individual may perceive familial or emotional ties with an organization or group that is akin to that of a parent or other form of personal relationship.

Relationship-marketing theory is “that customers vary in their relationships with an organization on a continuum from transactional to highly relational bonds” (Mann, 2007, p. 43). The core goal of this theory is the continual cultivation and reinforcement of positive relationships with donors. Initiatives focused on creating these relationships can become catalysts toward future donations. Practices such as strategic partnering,

strategic alliances, friend-raising, and network organizations are all examples of higher education activities that encompass relationship-marketing theory.

Mann's theories were used to form the theoretical lens with which to interpret the results of this study. When used in conjunction with each other, these theories allow for a broader understanding of the factors identified by the model and why they may be indicative of donor behavior as they relate to fundraising and the level of gifts that will be donated to one's alma mater.

Research Design

For this study, a secondary data analysis design was selected using alumni data from a traditional 4-year public institution of higher education in the Midwest. According to Mertler and Vannatta (2005), in non-experimental design, the researcher can define the independent variables but cannot assign individuals to the various groups, as subjects enter the study already belonging to various groups as categorized by the selected variables/groups. The alumni database of the mid-sized 4-year public Midwestern university was utilized to investigate the impact of data associated with demographics, professional and educational attainment, wealth, and institutional connectedness upon the likelihood of alumni financially contributing to one's alma mater and the predicted amount of money that would be donated.

Discussion

Research Question One

What factors are most likely to predict the likelihood of alumni making a financial contribution to their alma mater?

The variables selected for analysis for this study were influenced both by the availability of the data provided by the institution of study and prior research oriented toward alumni giving behaviors. The goal of this research question was to determine the factors that best predicted the likelihood of alumni making a financial contribution to the institution. The premise behind the methodology was to investigate the characteristics of current donors and then construct a model that could be used to predict the likelihood of someone becoming a donor based on institutional data available to fundraising professionals. The following variables were found to be significant factors in predicting the likelihood of alumni making a financial contribution to their alma mater: professional designation, constituent age, marital status, number of kids, ethnicity, business phone, extracurricular activities, undergraduate housing, distance from campus, alumni event attendance, college of business, college of nursing, participation volunteer, graduation year. To validate the constructed model and its ability to predict donor status, the calculated probability based on the beta values derived from binary regression analysis were arranged into percentiles and consisted of 20 groups. The higher percentile groups contained the constituents with the greatest likelihood of being a donor. Nearly 55% of all donors had scores between 15-20, representing the top six percentile groups. This technique of model validation was first used by Wiley (2004) and has been an effective tool in creating scores that are more meaningful and interpretable by professional fundraisers as a result of the reduced complexity and segmentation of constituents into rank order based on percentile score. The results of this model, as it relates to the number of donors that cluster to the top of the scoring schema, is seen as a success as it provides a definitive means of confidently removing alumni who are non-donors based on low value

scores. Understanding that these scores are derived from demographic data and are capable of accurately predicting over 77% of all donors is a substantial achievement and represents a significant step in establishing business processes and protocols based on the predictive models such as these to help strategically direct fundraising and marketing efforts at this institution. The success of this model should be interpreted within the context of the stated research question, such that this model is unique for this application of identifying donors, and this model should be reviewed if being used for targeted populations or marketing efforts that may require additional variables and analysis. Such applications may include identifying major donor prospects or annual fund donors. This is an important distinction, as this donor profile, represented by the variables that constructed the model, should not be seen as a donor profile that is indicative of individuals capable of making a major gift or contributing to a specific cause. Rather, these scores should be used when considering whether someone is likely to make a gift to the institution, and additional analysis would be required to determine to which cause, purpose, or area an individual would likely direct their financial support. The value of this model lay in the ability to systematically “discover” potential donors without the requisite of human intervention, freeing those responsible for such efforts to focus on more in-depth analysis of newly identified donors.

Research Question Two

What factors are most significant in predicting the amount of money alumni will contribute to their alma mater?

The data provided by the participating institution contained 20,000 records for analysis. The first time gift amount variable was a calculation of the amount of money

donated by a specific constituent to the institution for their first gift. In reviewing the first time gift variable, it was observed that only 28% of individuals in the sample had available data for this field. To manage the range of varying amount of first time gifts, three groups were created based on creating approximately equal populations. The three calculated groups were first time gifts between “\$.01-\$19.99”, “\$20.00-24.99, and \$25 or more. At first glance, the ranges for each of these groups may seem artificially low, but when analyzed in conjunction with the institution’s fundraising strategies, the monetary range for each group is more apparent. Many institutions have an annual giving office that seeks to educate and promote philanthropy amongst their alumni. This office typically seeks gifts that are much smaller than those considered to be major donations and can be considered a mechanism “to bridge the gap between operational expenses and income from tuition, fees and other sources” (Saint Joseph’s College, 2014). The vast majority of gifts directed toward an institution are at the annual giving level. According to the website Academic Impressions (2014), the top 10% of donors contribute approximately 95% of an institution’s fundraising campaign financial goal. This leaves 90% of donors that contribute 5% of the campaign amount through small gifts as compared to the top 10%. The dollar range of this variable differs amongst institutions, and many find that their giving ranges are far less than the major gifts that are generally reported in institutional publications or press releases.

To validate the model and its ability to predict the amount of the first time gift, the calculated probability based on the beta values derived from the multiple linear regression analysis were arranged into percentiles of three groups. Each percentile number corresponded with a specific first time giving group, where percentile group 1

represented first time giving group “\$.01-\$19.99”, percentile group 2 “\$20.00-\$24.99”, and percentile group 3 “\$25+”. Each group of the first time gift variable was then analyzed by evaluating how often the group was correctly predicted by the model. For individuals in the lowest first time giving group of gifts between “\$.01-\$19.99”, the model correctly predicted 54.9% of the cases. For individuals in the second first time giving group of gifts between “\$20.00-\$24.99”, the model correctly predicted 27.7% of the cases. For individuals in the third first time giving group of gifts “\$25+”, the model correctly predicted 34.1%. The intent of this predictive model was to provide a means for those responsible for raising financial support for the institution to classify individuals in groups that provide for a mechanism to prioritize their efforts in raising funds. While the ability to predict a specific dollar amount would be ideal, the grouping of individuals into various giving ranges still provides a distinct advantage. This ability to strategically allocate scarce resources toward individuals that are not only likely to give, but to give at the highest levels as determined by this model and giving categories, is a valuable mechanism in segmenting populations to concentrate fundraising efforts. Predicting the amount of money that an individual is capable of giving can still benefit from further analysis and investigation of other variables not available for this study, which may improve the predictive power of this model.

Implications

The findings of this study provide an opportunity to analyze the variables of a single institution and its ability to predict donor status and the amount of its first gift. Key areas of this institution may benefit from the findings of this research, specifically Development, Marketing and Communication, Advancement Operations, and Student

Affairs and other professionals that have daily interaction with students.

Fundraising Professionals

This study provided a comprehensive analysis of how predictive modeling and existing institutional data can be leveraged to create scoring models that can help segment constituents into prioritized groups. The statistical models create an opportunity for fundraising staff to strategically devote their time to individuals who are most likely to make a gift and make a gift at the highest giving levels. Additionally, these models provide a mechanism from which to evaluate prospects for fundraising purposes that would otherwise remain undiscovered without these statistical methods to give insight into the data. Individually, these models present unique opportunities to derive meaning from discreet data but, when combined, construct a powerful intersection of analysis such that those alumni that score very high on the first model to predict donor status and the second model to predict giving levels result in a data set of probable donors likely to give at the highest levels to the institution.

The importance of this work extends beyond career fundraisers and those charged with “making the ask,” and highlights the necessity for a collaborative effort between individual colleges, alumni colleges, and student affairs personnel. The results of this study provide evidence that volunteerism, undergraduate experiences, and alumni event attendance are all integral factors that increase the likelihood of alumni making contributions to their alma mater. Therefore, efforts should be coordinated amongst staff to create a strategic plan utilizing a multifaceted and disciplinary approach in creating a fundraising plan that first time and continual donors can be matriculated through.

Marketing and Communications Professionals

These models provide an opportunity for strategic marketing and communication with alumni that could facilitate tailored messages based on the likelihood of a donor making a gift and the propensity for making a large gift. Coupled with publically available data sets, such as census data and emergent data sets related to social media and other new data sources, these models can be expanded to provide even greater accuracy in determining the types of alumni that are most likely to financially contribute to their alma mater.

Advancement Operations

These models create an opportunity to utilize autonomous solutions based on incorporating these models into larger technological systems that may leverage other forms of data analysis and machine-learning techniques to identify high potential donor prospects from institutional or organizational databases with little user intervention. These intelligent systems may also become better able to identify, test, and recommend new variables based on transformations, new data sets, or patterns of behavior that would take human researchers far longer to identify and convert into actionable and meaningful results.

As massive computer power becomes more available through cloud services and the ability to rent time on large-scale computer clusters, internally developed models may be used as “lessons” to teach cognitive machines, such as IBM’s Watson, Siri, etc., how to understand fundraising patterns, behaviors, and data to enhance donor identification and provide institutions of higher education of the future the ability to have machines interpret their data and provide a thorough analysis with minimal human intervention.

Student Affairs and Other Professionals

Students who lived on campus and were engaged in extracurricular activities had a higher likelihood of becoming financial donors upon graduation than those students who were not actively engaged on campus. Therefore, any attempt to build a culture of philanthropy among alumni should begin with continuing to grow the undergraduate experience through programming, engagement, and experiential learning that create positive memories and experiences used to build campaigns around various affinity and social groups. The factors associated with the undergraduate experience are an integral component to creating an effective predictive fundraising model. Thus, Student Affairs and other professionals with daily contact with students should not be overlooked when developing strategic fundraising goals, plans, and outcomes.

Faculty

Sun et al. (2007), first noted the importance of contact with faculty, staff and administrators in the likelihood of an alum making a financial contribution to their alma mater. While, this study did not have the requisite data to test that finding, it is important that future research test that hypothesis, while also investigate the frequency of contact with these university agents at the undergraduate level. However, such contact must be recorded beyond classroom hours, but efforts must be made to collect such data as it relates to extracurricular activities, study abroad, or other forms of direct communication that could prove instrumental in creating a deeper connection to the institution. Additionally, once these student become alumni the data collection must continue and faculty, staff and administrators must make efforts to document and share their experiences with alumni with those responsible for capturing such data so that it can be

used for data mining and modeling purposes. The importance of such relationships cannot be measured and utilized unless effort and systems are in place to help faculty, staff and administrators share these experiences with the alumni office and institutions and fundraising professionals highlight the importance of the role faculty and others play in establishing and maintaining fruitful alumni relationships.

Limitations

A limitation of this study that may affect the generalizability of results to other institution is the variability of coding schema used to capture data about alumni populations. This variability requires that individuals seeking to replicate this study understand the construction of each variable and that the method of data reduction used for this study and availability of the data may not be feasible or possible at other institutions. The models created for this study are unique to the institution from which the data were obtained and, while the results in some circumstance align with prior research, it is unlikely that identical results would be achieved with data gathered from other institutions or sources. It is important to note that the statistical significance associated with the variables associated with the predictive models in the study should not be interpreted as levels of importance of the variables within the institutional database. The value of these models, variables, and constructed scores are unique to the institution from which the data were drawn and may not be useful without alterations for fundraisers at other institutions. The small number of identified minorities in the sample population used for this study severely limited the opportunity and ability to understand the motivations and tendencies of these groups as they relate to patterns of giving. Future studies would benefit from focusing solely on minority groups to more accurately

constructs models and formulate conclusion that are more representatives of these unique populations.

Recommendations

The use of predictive modeling in higher education has continued to increase as an effective means of developing actionable outcomes from data analysis and the proliferation of software that has reduced the complexity of executing these types of projects. Many of the scholarly articles and author such as MacDonell et al. (2014), Wylie (2004), and Thompson (2010) that focus on predictive modeling in higher education utilize very similar statistical techniques, but there is often a need to benchmark result sets against other institutions that are considered peer equivalents. The variability in data, institutional norms, and fundraising practices makes it difficult to generalize results and compare models in a consistent and meaningful manner. Future research should be conducted to create a framework from which institutions can define their models and the influence that various groupings of variables, such as demographic, alumni activities, and undergraduate experience amongst others, have upon their model. This type of broad information would make it easier for institutions to understand how their models differ from one another and provide a quantitative method by which to empirically compare or contrast models and results. An example would be an institution that had a model profile where the variable grouping of demographics (40%), alumni activities (10%), and undergraduate experience (40%), where the percentage of each grouping represented the amount of variance within the predictor variable and what groups were most significant for the model. This type of framework would serve to better understand the anatomy of an institution's donor base as it relates to their unique

donor interests and giving behavior.

The importance of available data that captures the various aspects of an alums relationship with their alma is integral to the robustness and accuracy of models created for fundraising purposes. Therefore, research must be conducted that analyses the existing practices of the transfer and sharing of data between those responsible for maintain undergraduate and alumni data. An articulated data transfer plan would provide those responsible for creating and conducting predictive model and data mining tasks less administrative and technical obstacles to overcome and increase the efficacy and efficiency of the modeling and mining process.

Conclusions

Institutions of higher education are sensitive to changes stemming from global, social, and economic fluctuations that affect the ability of alumni, friends, and private organizations to offer financial support. As the popularity of predictive modeling has grown, so has the number of studies that have sought to determine the efficacy and methods that institutions of higher education may employ to identify potential donors. The issue with relying upon pre-established models is that they may not effectively model the donors contained within the organizations database, nor may they contain the same variables. This requires that new analyses be conducted for any institution seeking to benefit from the potential of predictive modeling. Additionally, many studies do not attempt to predict the amount of money that newly identified donors are likely to give for their first gift, which was seen as a significant gap in the existing literature. Therefore, the purpose of this study was to enhance the sophistication of identifying and measuring the likelihood of alumni financially supporting a 4-year public Midwestern university by

using predictive modeling and data mining techniques to help increase the efficiency and financial success of strategic fundraising campaigns and initiatives. Two models were created that were designed to:

1. Identify factors most likely to predict the likelihood of alumni making a financial contribution to their alma mater.
2. Identify factors most significant in predicting the amount of money alumni will contribute to their alma mater.

The findings from this study were encouraging as both models both yielded Identified factors that aided in the identification of new donors and a projection of the amount of money those donors would make for their first gift. These models can provide additional depth and knowledge to key decision makers and existing reporting mechanisms that reflect calculated outcomes based on the probable sum of expected contributions and number of donors required to achieve strategic goals. The findings from this research identified key variables and variable categorizations that allowed for over 50% of donors to be accurately identified and 30-50% accuracy in predicting the amount of money they would donate for their first gift. Despite the perceived low accuracy rate of the predicted amount of the first gift, there is still significant opportunity for future research to continue to investigate the factors necessary to improve the performance of such models.

The ability to use a uniquely constructed statistical model to calculate giving probabilities and scores is a significant opportunity for this Midwestern institution of higher education to enhance their methods that identify potential donors and provide an additional mechanism for projecting the amount of dollars that could be received from

newly identified donors. The developed models provide a basis from which to classify potential donors based on available data contained within the institutional alumni database and give those responsible for fundraising an opportunity to strategically analyze their population for those capable of giving at the highest levels of financial support.

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